



International Conference

Circular Economy

Opportunities and Challenges



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Opportunities and Challenges

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Slovak Republic Innovativeness: an Analysis and Recommendations

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Abstract

Innovation is vital for any company as thanks to it, companies can gain or strength their competitive advantage over their rivals. Not only is for company important how they internally manage innovation, but their external environment should guarantee them optimal conditions. High capabilities to innovate translates into high growth for countries as well. The aim of the government is to set an innovation-friendly environment in which innovation is promoted and incentivized. However, in addition to the government, innovativeness is influenced by other elements. Among the others, very relevant are institutions and human capital availability. In addition, according to the literature, national culture and religion should not be overlooked. The current working paper attempts to shed lights on the performance of the Slovak Republic in terms of innovation. It is framed in the European Union, member since 2004, and afterwards its strengths, weaknesses and potentials are examined. It emerges that Slovak Republic poorly performs in innovation, and it is one of the worst among the members of the Community. It is argued that the country needs structural reforms and policies and government initiative that can improve institutions and enhance human capital quality.

Keywords: Slovak Republic, innovation, innovation performance, emerging innovators, indexes

Jel Code: O31, O32, O38

1. Introduction

Innovation is the main factor influencing and enhancing the competitiveness of a country [1]. It is key to improvements in living standards and can influence individuals, institutions, entire economic sectors, and countries in multiple ways [2]. It helps to address essential public policy challenges such as health, environment, food security, education, public sector efficiency and climate change [3]. Thanks to innovation, countries can enhance and strength their competitive position in the international panorama and increase the wellness of their citizens. Moreover, as

many studies have found, innovation and economic growth seem to be related. Innovations are employed diffusely in the economy and are the principal factors of economic growth and development of it [4] [5]. Innovation supports the growth of a country by adapting its capabilities and improving the overall productivity and making it more efficient. Indeed, retained earnings provide the resources for investments in productive capabilities [6], for instance, in new machinery, R&D department. It supports rapid technological evolution, shorter product life cycles and higher rate of development of new products [7]. Considering the numerous benefits of innovation for the country as a whole, the government's role is to create an innovation-friendly environment for companies. In fact, innovation is currently a top priority in governments' agenda [8].

Measuring innovation performance of a country is however a matter for debate among scholars and academics. Above all, they do not always agree on the measures used. Indeed, Indexes that have the aim to evaluate innovation of a country are continuously updated with the attempt to improve them and capture the true essence of the innovation performance of it.

This work is about the innovation performance of the Slovak Republic, among other countries in the European Union (EU) and within its territory. According to the European Innovation Scoreboard Slovakia is an emerging innovator (i.e. one of the lowest performer in terms of innovation among EU countries). Therefore, the study of innovation in this country might be interesting, especially to identify the weaknesses that its government has to strengthen and overcome.

The remaining part of this working paper is organized as follows: a brief literature review on innovation indicators, indexes and factors influencing a country performance, tools and methodology for the analysis and lastly conclusions and recommendations.

2. Literature review

2.1 Indicators and indexes

In the literature, discordant opinions can be found for what concern how to measure innovation. There is no general agreement on the indicators that best can take a snapshot of the innovation performance of a country. What is more, considering indicators alone would not give a complete and satisfactory picture of the country under analysis, due to their particular aspect of innovation they measure. Firstly, it is fundamental to include in the analysis both input and output measures. A mostly often used indicator for input is R&D expenditure, whereas patents for output. R&D activities produce new knowledge that contribute to the productivity of a company and of the overall country [9]. Although R&D and innovation, R&D and economic growth and innovation are positive and significant [10], it has the drawback to measure only the expenditure allocated for related R&D activities, without being able to measure innovation outcome [11]. Thus, R&D should be analyzed along with other indicators for the output. Usually, patents are used for output – and which assess the degree of innovation [4] - thanks to the World Intellectual Property Office

(WIPO), which standardizes those issued by different countries and as a result allows for international comparisons. However, it is often criticized as a measure for it, since not all innovations are patented [12] and as such the resulting figure is not inclusive. As a matter of fact, companies may use other measures to protect their innovations such as lead time and secrecy [12].

In addition to the above, human capital is acknowledged to be one important and essential factor contributing to the overall growth and innovation of countries [13]. In periods that do not feature crisis or economic downturn, human capital can be considered a solid measure of innovation [14] and a catalyst for innovation. It is positively correlated with R&D expenditure, number of patents filed and high-technology effort [15]. The countries with the highest innovation performance are often the ones with the best scores in human capital indexes. In certain indexes, scientific publications contribute to the overall evaluation of human capital. Thanks to it, knowledge can be advanced and spread all over a country, contributing to its progress.

Education and learning are human capital fuel. According to Leonard and Sensiper (1998) the latter are “some key factors for innovation” (cited in [5]). Therefore, it is important to invest in them. Education is an investment, sometimes a cost one, which in the future turns out to have a high return. This idea that human capital can be cultivated was generated in the second part of the 20th century: it is an intrinsic feature of humans, not only consumers of training and of education but also an investment in themselves [16]. Because of the need for digital skills, to be able to “participate actively in the Digital Decade and to reinforce our collective resilience as a society” [17], the digital literacy of individuals should be considered in the human capital evaluation of a country. The DESI index – capturing the digitalization level of countries – provides a figure for the digitalization level of individuals, the percentage of Information and Communication Technology (ICT) specialists and graduates and the share of the enterprises providing ICT training.

Attempts to make an extensive and somewhat satisfactory evaluation as comprehensive as possible in assessing a country innovative performance are indexes, which are usually an average (weighted or not) of several selected indicators. A renowned index used in the European continent to measure the performance among different States is the European Innovation Index (EIS). It evaluates relative strengths and weaknesses of national innovation systems and offers a picture of countries to identify the areas in need of intervention [18]. It bases its evaluation on an unweighted average of 27 indicators. The EIS uses statistics from Eurostat, OECD and United Nations. The index groups countries according to their performance in four main clusters. Innovation leaders (performance > 125% of the EU average), Strong innovators (between 100% and 125% of the EU average), Moderate innovators (between 70% and 100% of the EU average) and Emerging innovators (< 70% of the EU average). Similar index is the Regional Innovation Scoreboard (RIS), which uses the same indicators of EIS but for the evaluation of innovation performance within countries, the same labels for groups, but less indicators.

2.2 Factors influencing country innovation

The determinants of innovation are the following ones (cited in [19]). Patent law (Moser, 2005), labor laws (Acharya et al. 2013), taxes (Mukherjee et al. 2017), competition (Aghion et al. 2005),

human capital (Cinnirella and Streb 2017), tolerance for failure (Manso 2011), and myopia (Bian and Meier 2021). In addition, skill mismatch should be minimized as much as possible through targeted policies increasing worker mobility and incentivizing lifelong learning [3]. If competition among firms is effective, innovation can be diffused also for lagging firms [3]. In the EU, the competition law ensures that competition is not threatened by attempts to monopolize the market. In addition, governments have to reduce bureaucracy, especially to ease doing or start businesses may contribute to enhance innovation level.

Capable institutions and effective policies for innovation in place are also important [20]. Good institutions eliminate unnecessary barriers to innovation (e.g. corruption; better intellectual property policies), and they ease the process of registering new patents, to spread ideas across researchers, spread current knowledge, enforcement of property rights and reduce the uncertainty of new projects. [21] argue that qualitative institutions that contribute to innovation are inclusive. They offer broad access to economic opportunities (instead of favoring the few at the expense of the many). It is with no surprise then that innovative activities converge in developed countries whereby innovation can find fertile ground. High levels of innovations are possible thanks to institutions [22]. Strengthening the national system of innovation can lead to the formation of associations of inventors, which often serve the role of intermediaries and catalysts assisting inventors to obtain patents and, if successful, starting their own business to manufacture and market their inventions [23].

National culture, social factors and religion seem to affect the orientation of a country towards innovations, innovation capabilities and creativity. [24] assert that innovative activities need a culture of strong risk tolerance. As [25] found, innovative societies distinguish by liberal values such as individualism, and low masculinity (i.e. gender egalitarianism is higher), long-term orientation (e.g. perseverance, hard work and savings), and indulgence (featured by optimism and having fun). Social freedom and formal stable institutions (i.e., democracy) lead to high levels of innovation behavior (see [26]). Besides, with the exception of several authors (e.g. [27]), according to the literature (e.g. [28]), the more religious a country is, the less innovative is a country. In countries whereby innovation is negatively influenced by religion and culture, governments should implement policies able to minimize cultural tendencies inhibiting innovation and enhance education and increase individuals' consciousness of innovation and encourage secularization in non-religious social activities [25] [29]. Political instability is an obstacle to innovation [30] as, for example, potential foreign investors would be discouraged to make an investment in that country. Lastly, widespread corruption is a problem for innovation too.

3. Tools and methodology

The following research questions were formulated:

How it can be categorized the country with respect to other EU members?

What are its strengths? And its weaknesses?

How can it improve?

To accomplish the aim of this article, selected indicators were analyzed. The abovementioned indicators, human capital, patents issued, and R&D expenditure are the most often used ones, despite of their drawbacks. Using EUROSTAT, OECD database, and selected indicators of EIS, the following measures were analyzed more in detail:

- *Human capital*: population with tertiary education; population involved in lifelong learning (participation rate in education and training in the last 4 weeks); population with above basic overall digital skills; DESI human capital; Education expenditure (as % of GDP); Scimago & Country Rank.
- *R&D expenditures as percentage of GDP*.
- *Patents issued*: PCT patent application.
- *Corruption*: Corruption Perception Index.

Moreover,

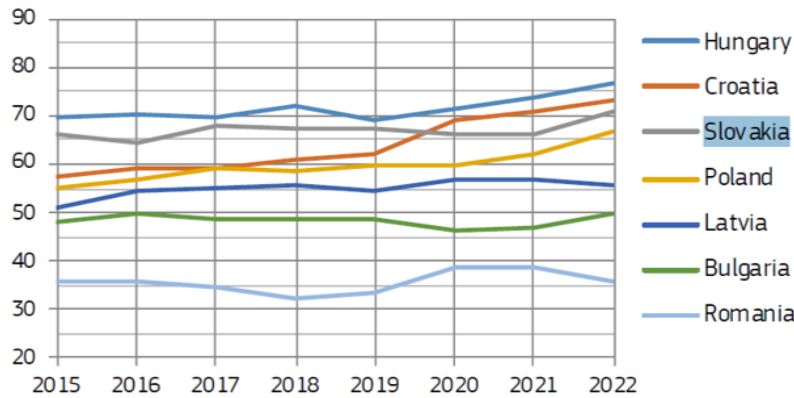
- EIS is analyzed to frame the Slovak Republic (SK) in the EU context; and
- RIS for an analysis of differences in innovation performance within its territory.

4. Findings

Analyzing the latest report of EIS [18], SK belongs to the emerging group of countries for its innovation performance. It shares this status with Croatia and other Central and Eastern EU member countries (Fig. 1). Thus, SK is one of the worst innovator among all EU member countries and performing below EU average, and among VISEGRAD ones, only Poland does worse.

Even so, its performance has improved from the base year 2015 by 4.6%.

Figure 1: Emerging countries for innovation



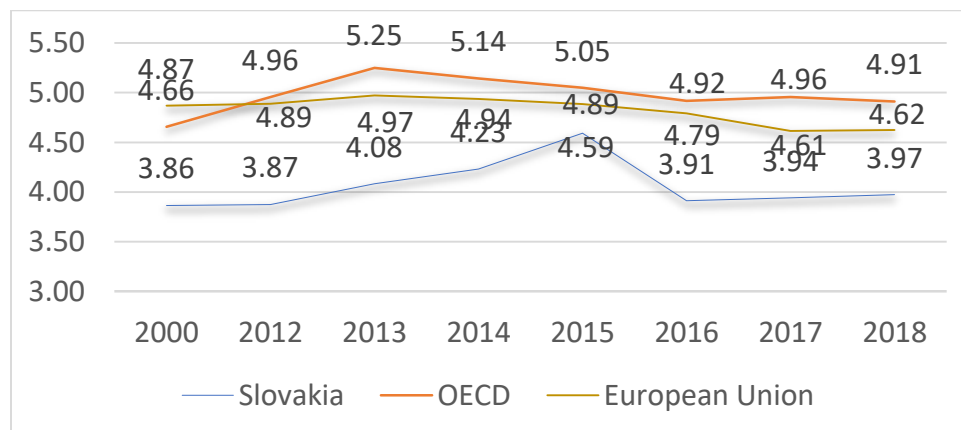
Source: [18]; p. 22)

According to EIS, SK performance for what regards government support for business R&D, R&D expenditure in the business sector, Lifelong learning and PCT patent applications are relative weaknesses.

4.1 Human Capital

The participation rate in education and training in the last four weeks (latest data available: 2021) was 4.8%, making SK the third last place before Greece and Bulgaria and below EU average (10.8%) [31]. Considering public spending on education (as % of GDP), SK is well below OECD as well as the EU average (Fig. 2) [32].

Figure 2: Public spending on education



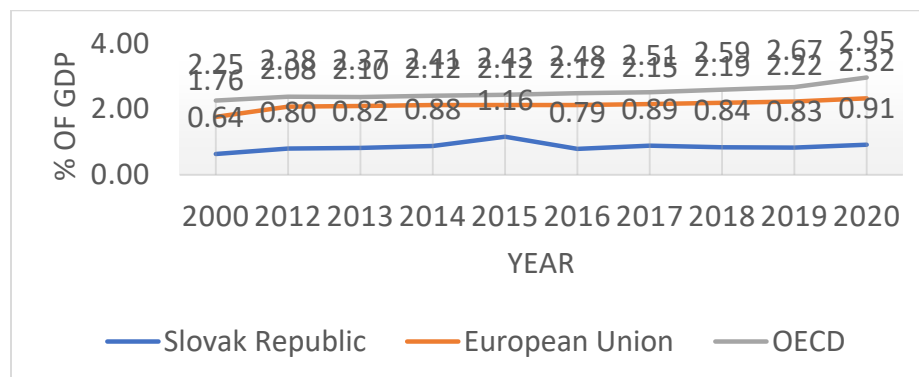
Source: OECD (2022), own processing

Population with tertiary education (25-34 years old) is below average with a 7.6% gap (2021) with respect to OECD average [33]. Furthermore, for what regards the digital level of the population, the DESI index was consulted. Overall, SK are possessed by the 55% of the population, which is in line with the EU average (55%). A scientific ranks 23rd among the 27 countries of EU, whereas for its human capital component it is 19th, below EU average. Basic digital skills publication indicator is the one of Scimago Journal [34]. SK is 18th in this ranking with a contribution of about 4% to the overall EU citation.

4.2 Input and Output measures

The R&D expenditure (as % of GDP) for SK and a comparison with EU and OECD is illustrated in Figure 3. Analyzing it, in the observed period, SK has always invested less than 1% of its GDP, with the exception of 2015 (1.16%) in which the difference between EU and SK was minimum. In 2020, R&D expenditure was less than half the amount invested in EU (2.32% on average) and one third less than OECD average (2.95%) [35].

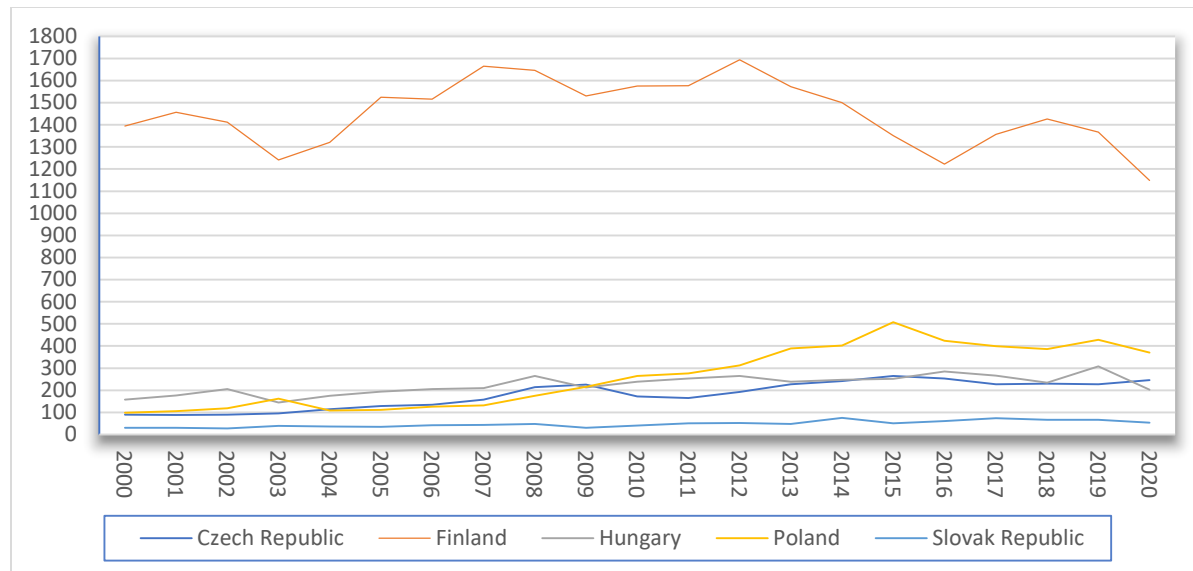
Figure 3: R&D expenditure as % of GDP



Source: [35], own processing

Patents (the output of innovation activity) was measured through PCT patent application number. In Fig. 4., the trend for SK is roughly a plateau. Among the countries considered, VISEGRAD members and Finland, one of the best performer in the number of PCT patents applied, SK is at the bottom with only 53 patents issued in 2020 [36].

Figure 4: Patent applications filed under the PCT in selected countries



Source: [36], own processing

Lastly, analyzing the corruption perception index (2021), SK scores 52 (the higher score the lower corruption perceived), doing better only than Romania, Hungary and Bulgaria in EU.

4.3 Innovation within the SK territory

The RIS gives a picture of the different performances of SK regions. The latest edition of the report (2021 [38]) identified important and marked differences between the regions.

RIS divides SK in four regions. According to Table 1, with the exception of Bratislava region, SK capital (SK01), the regions perform in line with the EIS evaluation as emerging innovator. Nonetheless, important improvements occurred in SK02, SK03 and SK04 compared to EU in 2014. SK02 and SK03 increased their performance by 9.5 and 10 respectively. SK01 marginally worsened its score by 0.6.

Table 1: Performance of regions in SK

Regions	2021 relative to EU in 2014	2021 relative to EU in 2021	Change over time compared to EU in 2014	Performance subgroup
SK01 Bratislavský kraj	100.4	87.5	-0.6	Moderate innovator

SK02 Západne Slovensko	63.8	55.5	9.5	Emerging innovator +
SK03 Stredné Slovensko	66.0	57.5	10.0	Emerging innovator +
SK04 Východné Slovensko	62.7	54.6	4.3	Emerging innovator +

Source: RIS, 2021

In some indicators, Bratislava Region is a strong or even leader innovator. For instance, it is one of top performer in EU in *population aged 25-34 with tertiary education* and for *Employed ICT specialists as a percentage of total employment*. Generally, SK01 outperforms the remaining of SK. The exception is *non-R&D innovation expenditures in SMEs as percentage of turnover*, which performs lower in SK01 than other regions. Perhaps there is a higher concentration of SMEs in other areas. Other indicators are more or less in line across all the regions.

5. Conclusions and recommendations

As highlighted in this paper, innovation brings several benefits to countries. As such governments must provide the best conditions to their territory to incentivize companies to continuously innovate. It was discussed several of these incentives and factors influencing the country innovation such as corruption, taxes, human capital and institutions.

According to the findings, even if SK has noticeably improved its performance in the years, it is one of the weakest innovator in EU with low scores in the EIS and in the analyzed indicators. Moreover, according to RIS, Bratislava Region differs substantially from the other SK regions. The government has to intervene in key areas to promote and increase the innovation performance all over the country. One of the intervention ought to be towards the fight of corruption and to improve regional institutions – that can be considered innovation reforms [20]. Examples of interventions are:

- More transparency [39]; and
- A working system of control and sanctioning of inefficient and unauthorized government behaviors [20];
- Surer and more severe punishments to the corrupted and corrupting individuals.

The SK government has started to implement various measures and policies to improve innovation, as the super tax deduction. Thanks to it, companies have tax savings that can be used for financing, even their further R&D, or just increasing their net profit, which can be paid to shareholders [40] in form of dividends. Other measures are tax credits, indirectly, for what produced in R&D department or directly, through contracts, grants and awards [41]. However, this is not enough.

Critical is to avoid any inefficiency that can arise in these policies: transparency and simplified bureaucracy must be assured.

Interventions are required for education area as well. Part of the funds of the Resilience and Recovery facility provided by the EU is aimed at improving digital skills. SK will implement reforms to include school curricula and learning materials to include “digital skills and teach computational thinking” in their school curricula [17]. Hopefully, future reports will see improvements in these figures.

Moreover, in 2021, with the new lifelong learning strategy adopted by the government, lifelong learning indicator may improve. The strategy goal is to make the Slovak education system more flexible and digital, providing new opportunities for adults and continuous learning, and needs of the job market [17]. This, in turn may be beneficial for skill mismatch minimization through targeted policies increasing worker mobility and incentivizing lifelong [3].

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"Green economy" unites the world

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Abstract

The year 2021 is characterized as the year of the pandemic, and 2022 - the issue of martial law in Ukraine throughout the territory still arises, but the raised issue of development and creation of competitive products on the world market - is not removed from the agenda. To solve this problem, innovation plays an important role, the implementation of which makes it possible to create services and potential products that will satisfy modern needs and bring profit.

The article examines the problems of management of innovative and active enterprises in the modern globalized society. External and internal factors are analyzed that prevent the effective implementation of innovative activities under modern conditions at the enterprise. The main modern problems in the management of innovative and active enterprises are defined. In order to eliminate the lag in the innovative development of Ukrainian enterprises, compared to European enterprises, it is necessary to form a significant number of enterprises that use innovative technologies based on such principles as the principle of integration of innovative projects, the principle of the balance of the innovation system based on systematization and continuity.

Along with the rest of the world, Ukraine entered the era of the Fourth Industrial Revolution in the second decade of the 21st century. The stage of breakthrough technologies is rapidly approaching in a world where innovations are introduced, preference is given to digitization and interaction of artificial intelligence, blockchain, the Internet of Things, robotics, 3D printing, drones used in the military period, genetic engineering, nanotechnology, which are gaining new positions on world market.

Along with 3 basic elements - economic and ecological, sociological, financial is also distinguished. The emergence of "green finance" and the development of the "green economy". There is no fixed understanding of the definition of "green finance".

Keywords: Innovative activity, strategic management, system, "green finance", competitiveness

Jel Code: M 21, O 31, R 51

1. Instructions

Market relations and their development in modern conditions, associated with increased competition in economic systems from the state to an individual entrepreneur at various levels of business contacts. Anticipatory socio-economic development is provided by the challenge of the need to strengthen the activation of the potential of business entities and strengthen their competitiveness, which is expressed by such qualities and advantages. In their research, the majority of scientists consider the categories of competitiveness to be universal and key, which are associated with increasing the potential of goods produced in a given territory, represented on interregional and regional markets. It contains a different structure, the content load of the category and comes down to determining the advantage over other participants of economic activity.

It is proposed to consider the essence of the formation of competitiveness from the standpoint of individual fields of research, but the factor characteristics of the economic situation of the region, the influence of which has a dualistic nature (the role of the region as a participant in competition, and on the other hand as an organizer of market relations) are investigated [1].

Analysis of recent research and publications. This question was investigated by O. V. Dobrovolska [2], R. Solow [3], N. M. Vnukova [4], A. Thomson [1]. Even in the 20th century, R. Solow developed the ideas of technological progress, the theory of economic growth, sustainable development [3].

Innovative activity covers various spheres: production, social, marketing, social, but the main thing is its successful activity. This process can be effective under the conditions of implementation of strategic management of innovative activity. Strategic management is defined as a general philosophy of development of a business organization or a territorial economic complex, as a set of principles of organization development, as a specific plan of action, as a model of the future state.

Strategic management from the standpoint of general management is recommended to be defined as a set of specific management decision-making processes regarding the definition of organizational goals and goal formation, the selection of a strategy for its activities and the use of resources in the market environment that ensure the implementation of these strategies [6].

It involves strategic management of defining key positions for the future depending on the priority of the whole; allocation of organizational resources for strategic goals regardless of the actual management structure of production and economic activity; creation of leadership centers for each strategic goal, evaluation and stimulation of production units and their managers depending on the degree of achievement of strategic goals[7].

Strategic management is a permanent process. It is carried out in a changing environment and with an updated state in the production potential every time, it needs to find more effective ways of implementing strategies. In the field of entrepreneurship and territory management, there is a need to make certain corrections in target settings, tasks, content and formation of implementation strategies, especially in the field of innovative activity - dynamic changes.

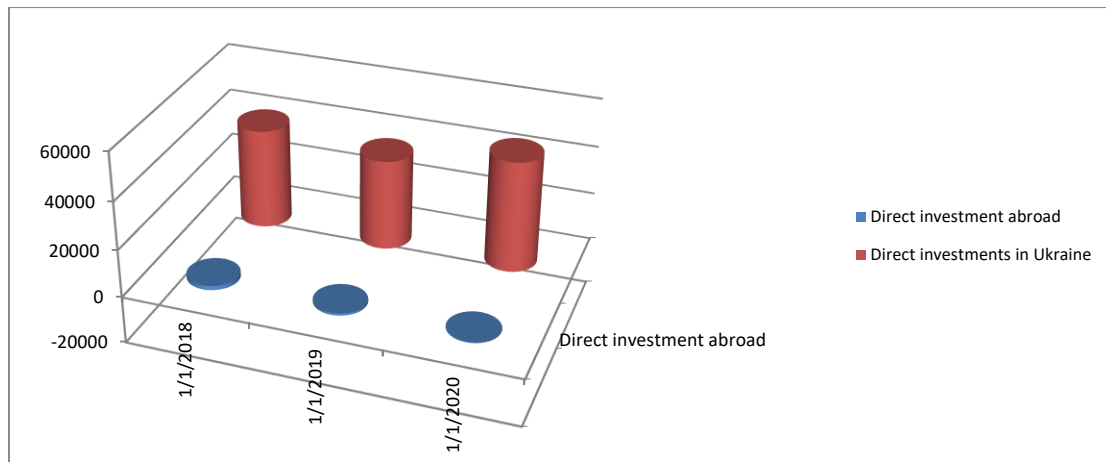
The components of the strategic management process are the monitoring of strategic management with innovations, the assessment of the degree of implementation as a whole, the implementation

of strategies and the effectiveness of strategic management, the analysis of changes in the external environment, production potential. The goal of strategic management is the development of an innovative enterprise, the vision of these positions in the future on the market under the conditions of changing external circumstances, which are constantly changing in the economic situation, taking into account global shifts. The issue of forecasting global changes in economic situations and the results of scientific and technological progress, predicting and identifying factors of future success, finding large-scale solutions, and their implementation that will affect the competitiveness of the economic system is touched upon in the organization of strategic management. In many countries, strategic management is performed on the basis of mathematical forecasting and modeling methods using strategic development models, as in the United States of America 5-10 years ahead. And in Japan, strategic planning methods appeared earlier than in the United States of America, and several strategies are used depending on the type of product and the type of enterprise [8].

Strategic management of innovative activities has the task of achieving the company's goals by optimally using its internal resources, taking into account the factors of its external environment and working on bringing the existing potential into line with the external circumstances, which are constantly changing in order to increase the level of competitiveness and functioning in the future [9].

Management that is based on human potential as the basis of the activity of the organization at any level - strategic management of innovative activities, it focuses its specific activity on the needs and requests of consumers, responds flexibly and makes changes in the organization in a timely manner that meet the challenges from the outside environment and contribute to obtaining competitive advantages, which in sum allows the system to survive in the long term and at the same time achieve the specified goals.

It should include not only the strategic goals that determine the development of the business entity, but also the ability to quickly respond to certain changes in certain market conditions, to change the directions of development, and sometimes also certain goals of the enterprise. Strategic management of strategic activities is based on general management theory.

Figure 1: Direct investments in the economy of Ukraine for 2018-2021, million dollars. USA.

Source: [10]

Observing the dynamics of investments from Ukraine, it was established that in 2019 investments amounted to 907 million dollars. USA. This is an average figure, the highest was 1743 million dollars in 2018. USA. 2020 is the lowest figure -295 million dollars. USA. This was influenced by a number of negative factors: economic crisis, diseases, pandemic. Capital investments in Ukraine: the highest figure of 46,213 million dollars. USA falls in 2020, and the lowest in 2019 is 37600 million dollars. USA

The competitive advantages of Ukraine from the point of view of the current and potential state of its development are as follows: favorable geopolitical location of Ukraine at the key point of transportation of goods from Europe to Asia, and from the North to the South; significant availability of natural resources based on proven reserves of manganese ore, iron, kaolin, potassium, clay raw materials; inexpensive and qualified labor force; inexpensive consumer basket. These are not achievements of the economy.

In a number of countries at the current stage, "climate finance", "green bonds", and "green loans" have also appeared, where issues of financial support are becoming important for effective policy.

Since 2015, 13 countries have introduced national or local taxes on carbon emissions. According to the conclusions of UN experts, up to 46 billion dollars are needed to comprehensively meet the needs of the "green economy" by 2050, about half of which should be directed to the development and implementation of renewable energy infrastructure facilities, 20% - to mitigation and adaptation of the consequences of climate change, from 3% to 5% - for the development of smart agriculture[11].

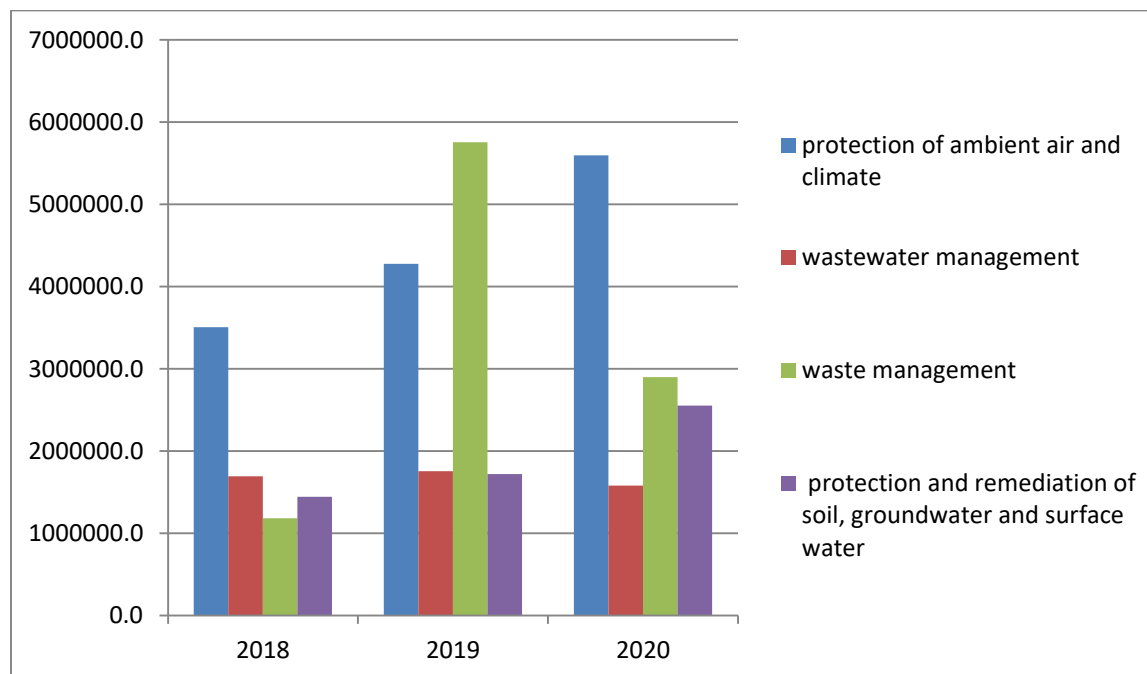
The Ministry of Education and Science of Ukraine highly appreciates the professionalism of scientists and innovators and holds an annual competition for the Prize of the Cabinet of Ministers

of Ukraine for the development and implementation of innovative technologies. In 2022, 17 works were presented in the competition, including works on the "green economy"[12].

Today is important for Ukraine, where new technologies are introduced, the legislative base is expanded, and cooperation with the countries of the European Union is established. To eliminate shortcomings in production, qualitative changes are being monitored and innovations are being introduced aimed at transitioning from the "linear economy" to the "circular" model, which improves the economic climate of our country, creates new market niches, and attracts foreign investments [13].

In the conditions of the development of Industry 4.0, for the regulation of economic activity, taking into account the transformations related to the changes of the industrial revolution, the rapid virtualization of the world, developments in the field of law are needed to interest various categories of economic entities[4][5].

Figure 2: Capital investments on environmental protection, by type of environmental domain at current prices, thsd. UAH



Source: [4]

In 2020, the most investments were made in atmospheric air protection - UAH 5,595,319.4 thousand, and in return water treatment - it decreased compared to 2019 by UAH 175,667.7 thousand; waste management almost doubled, by UAH 2,854,467.5 thousand; soil protection - increased by UAH 832,299.6 thousand. The total amount of investments for environmental protection in 2020 is UAH 1,323,649.8 thousand[14].

Economic studies of recent years show that knowledge is ranked as important as capital and labor in a number of factors. Technologies and their effective application determine the role and place of the country in the world community, the standard of living of the population, and the level of national security. The epicenter of the wave of basic innovations is created by the leaders of the United States of America, Europe, Japan, and Australia. They are joined by new industrialized countries - South Korea, China, Singapore. As a result of transformational transformations and scientific and technical progress, the industrial industry of the 21st century (Industry 4.0) is different in terms of organization methods and technology.

Subjects of work have evolved. In addition to traditional wood, iron, and fur, super-strong materials with certain properties are used. [15]

Cores 6 and 7 of the technological framework are based on the synthesis of nanotechnology, the achievements of molecular biology and the further progress of information and communication technologies.

Non-traditional energy solves the problems of reducing the load on the environment and saves natural resources. It can be implemented in the fuel-energy complex (hydrogen and solar energy, nuclear, fast reactors, vortex heat generators, fast reactors, synthetic fuel). Biotechnologies and materials include a new level of well-being, purify and desalinate seawater, cure diseases, clone and modify agricultural crops in agriculture; amorphous metals, materials with memory, high temperature and superconducting. Ecology considers "zero-waste and closed technological chains".

Transport solves problems of environmental safety, speed, efficiency, underwater superliners, string transport, electric cars, aerospace transport. Information systems solve the problems of globalization of the world economy on the basis of partnership: bioenergy, optics, artificial intelligence, quantum-vacuum computers, torsional communication systems. [16]

The quality of innovative and digital development institutes in Ukraine is created due to institutional transformations based on the following processes. Updating the creation of the design of new digital (import of borrowed state-of-the-art institutes), adaptation of existing formal digital institutes

The modern development of society is called the informational, sometimes "third wave" or post-industrial society, which is characterized by the features of the previous stage - the industrial society was based on the development of large-scale production, then the foundation of the post-industrial society demonstrates the digital economy and innovation. Its institutional foundations are characterized by innovative and digital processes [4]

Transformational, institutional processes are accompanied by systemic changes in the subjects of political, economic, and ideological relations. They represent a complex hierarchical system of relationships between governing bodies, types of economic activity, members of society and enterprises. The result of the institutional transformation is the influence of a new paradigm of the economic and socio-political system. Factors that influence the formation of the institutional environment in the country are legislative, organizational, managerial and economic.

The transformation of the technological method of industrial-type production is a process of fierce institutional competition, caused by the fact that new technologies ensure the reduction of material-low production, regardless of whether they were created by their own forces or bought (borrowed). Economic agents of these institutes use technologies during production activities, receiving profits. A powerful social base was characteristic of technological innovations of industrial-type production of the 20th century.

Basic innovation created jobs, formed new needs, and destroyed existing professions, devalued outdated knowledge and irrelevant experience, creating structural unemployment. The transformational processes of the 20th century were marked by dynamism in three types of disturbances.

As a result of technological innovations:

caused by changes in the socio-economic order, as a result of crises;

associated with socio-political conflicts and conflict of interests.

Conclusion. When studying modern problems of management of innovatively active enterprises, effective functioning in modern conditions is possible in the case of investing funds in the innovative development of the enterprise. A successful innovation will strengthen the financial position on the market, and will be beneficial for the functioning of the enterprise. Competitiveness, efficiency improvement is effective management of innovatively active enterprises. Information and innovative technologies are a management tool that serves to coordinate and control the course of business processes in the enterprise.

In order for them to act most actively, it is necessary to carry out appropriate changes in the entire management system, which should include the improvement of the organizational structure of the enterprise and the introduction of a process approach to management.

States are developing, nations and national economies are forming and flourishing, human civilization is developing, there are different approaches and new methods for the development of the Earth are emerging, which unite the world, globalize problems, accelerating the transition from the "linear economy" to the "green", attracting large volumes of investments, volunteers, specialists in various fields.

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Financial support tools for the development of business models of agro-circular economy

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Abstract

Financial support tools for the development of agro-circular economy business models are proposed. The peculiarities of financial support through such instruments as public-private partnership, venture capital and private equity capital, crowd-funding, European and International grant programs for sustainable development, state financial subsidies and industry subventions, loan guarantees, the mechanism of administration and formation of conditions for sustainable development are revealed. agribusiness, state and private-partner support for investments, credit lines for agro-circular economy projects, financial reporting based on circulars and sustainable development standards. It is substantiated that the priority direction of financial support for this development should be the transformation of agriculture into a single closed model of the agri-food sector, which should be aimed at effective management of resources, waste, preservation of biodiversity to ensure the closure of cycles of materials and resources into a single organic system. The role of the state and its institutional bodies in ensuring an effective financing mechanism for the development of circular agribusiness belongs to the state and its institutional bodies. Measures to reduce the riskiness of agro-circular investment projects are proposed. It is substantiated that the voluntary adoption and use of sustainable development standards reduces the riskiness of financing circular agribusiness projects.

Keywords: agricultural sector, circular economy, financial support tools, investments, agro-circular economy projects.

Jel Code: F14, O13, Q10

Introduction. The implementation of the goals of sustainable development, which today are the strategic priorities of the management of social development, require the development and implementation of new business models of management, focused on resource conservation, climate change prevention, food security and the preservation of the natural and ecological environment for current and future generations. An exclusive role in solving these tasks is given to the agrarian circular economy, which takes part in the creation of value chains, which are the most valuable for ensuring the quality of life of the population. Agriculture has always been a rather expensive type of economic activity in terms of resources. The traditional linear model of agribusiness in the long term no longer satisfies the needs and interests of society. This objectively requires a transition to new models of agricultural management, the basic principles of which are the rational use and recovery of resources, preservation of the environment, sustainable development of agribusiness and rural areas. The implementation of closed models of agribusiness in the practical plane requires the search for appropriate sources of financial support and effective institutional support.

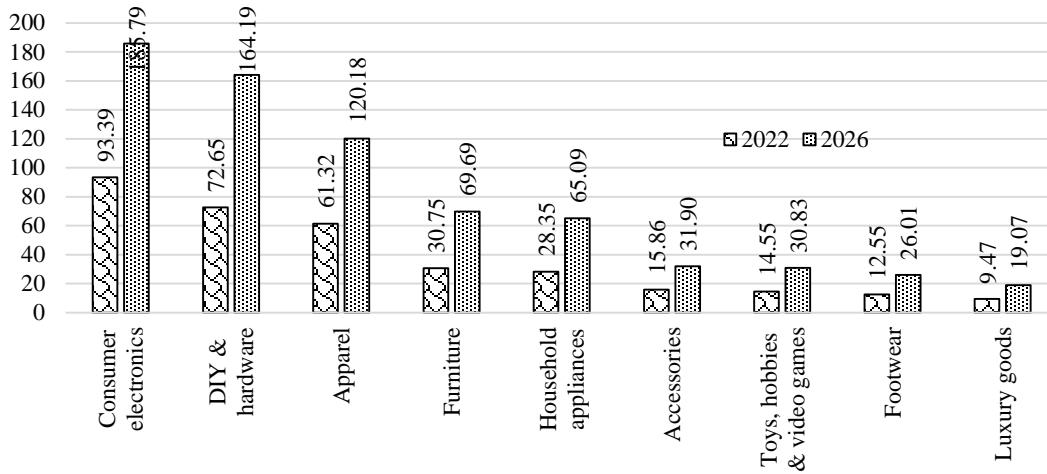
Literature review. The scientific and practical problems of ensuring the sustainable development of the national economy, in particular, in terms of the development of the circular economy, have recently been in the spotlight of famous domestic and foreign scientists, the theoretical, methodological and practical basis of their scientific works form a powerful framework for solving this complex and urgent problem today. Among the scientists who made a powerful contribution to the development of the specified problem, the following should be noted: T. Berger, D. Carrez, N. Boken, N. Millar, P. Leuven, M. Saineni, N. Horbel, S. Whitman, Z. Galushko, Zh. Derii, N. Butenko, K. Kononova, V. Loiko, T. Merkulova, N. Trushkina and others.

Tools and methodology. To give a general vision of circular economy let's look at the most important indicators that characterize it:

estimated revenue generated from circular economy transactions in 2026 will be near 712,74 billion U.S. dollars in comparison to 2022 – 338,88 billion U.S. dollars. So, the volume should almost double [1];

as we can see the most important branch of economy is consumer electronics, but at the second place is hardware and DIY with almost similar figures. The less important branch is luxury goods. The general rate of gross of all these branches is double. Unfortunately, only very few branches of economy can be represented in circular economy, and we can't see here agricultural sector that means insufficient attention to this item in this branch of economy (Figure 1);

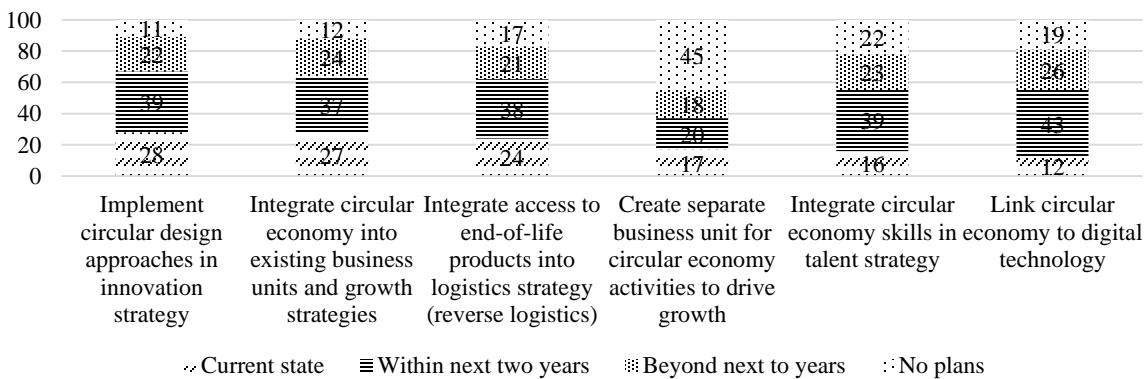
Figure 1. Estimated revenue of the circular economy market worldwide by category



Source: Statista (2022). Estimated revenue generated from circular economy transactions in 2022 and 2026 worldwide [2]

if we look at the most popular strategies of implementing circular strategies (Figure 2) entering the model of business, we can see that the most promised for the next two years is making interdependence between circular economy and digital technology, but nowadays this is the less popular strategy. The bottleneck of all these types of strategies is creating separate business unit for circular economy and the main idea is a very strong plan for implementing circular strategies for the nearest future. It means that businessman all over the world understand the huge importance of this type of economy;

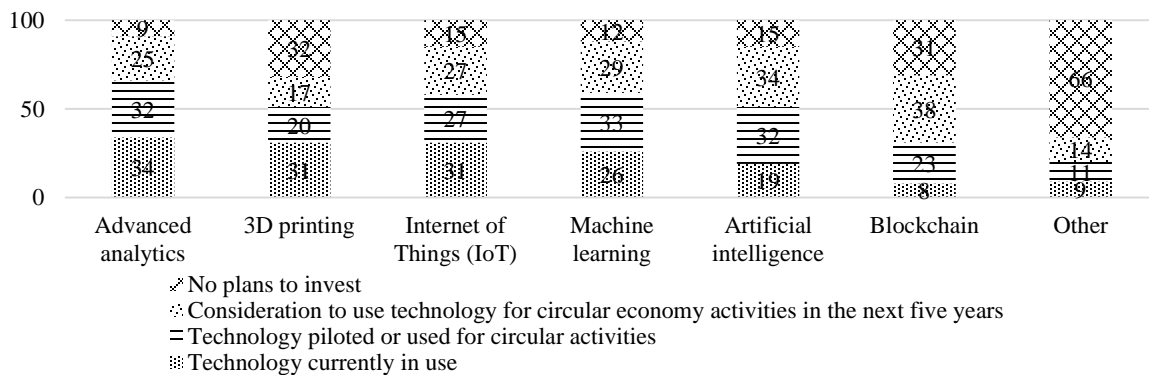
Figure 2. Strategy of supply chain firms to integrate circular economy practices worldwide in 2019 [3]



Source: Statista. Strategy of supply chain firms to integrate circular economy practices worldwide in 2019. (2022) [3]

another side of analysis of circular economy is understanding the most popular technologies (Figure 3) that is used and can be used more and more to enable secure economy activities in supply chains. As we can see the most important nowadays is advanced analytics, at the second place is 3D printing and Internet of things. Next place is by machine learning and artificial intelligence, blockchain place one of the less important roles in circular economy nowadays, but it has the biggest potential for developing in their nearest five years. As we can see all these technologies relate to informational technology, Internet-technologies, communication, and neural networks;

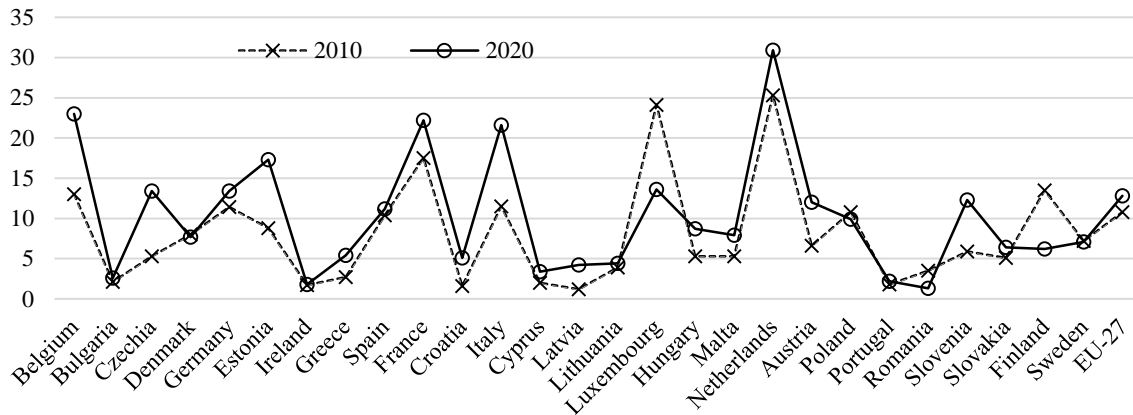
Figure 3. Leading technologies used to enable circular economy activities in supply chains worldwide in 2019 [4]



Source: Statista. Leading technologies used to enable circular economy activities in supply chains worldwide in 2019 (2022) [4]

except general vectors of developing technologies in circular economy it's very important is to analyze the difference in rates of secular material use in different European countries (Figure 4). As we can see, the spread of the values of the indicators of the use of materials in different countries of the European Union shows the different policies of the countries towards the establishment of a circular economy: the leaders are the Netherlands, where almost a third of the materials are recycled, compared to Bulgaria, where the indicated coefficient is equal to "3". Ukraine should focus on the leaders and apply the successful experience of developed countries.

Figure 4. Circular material use rate in the European Union [5]



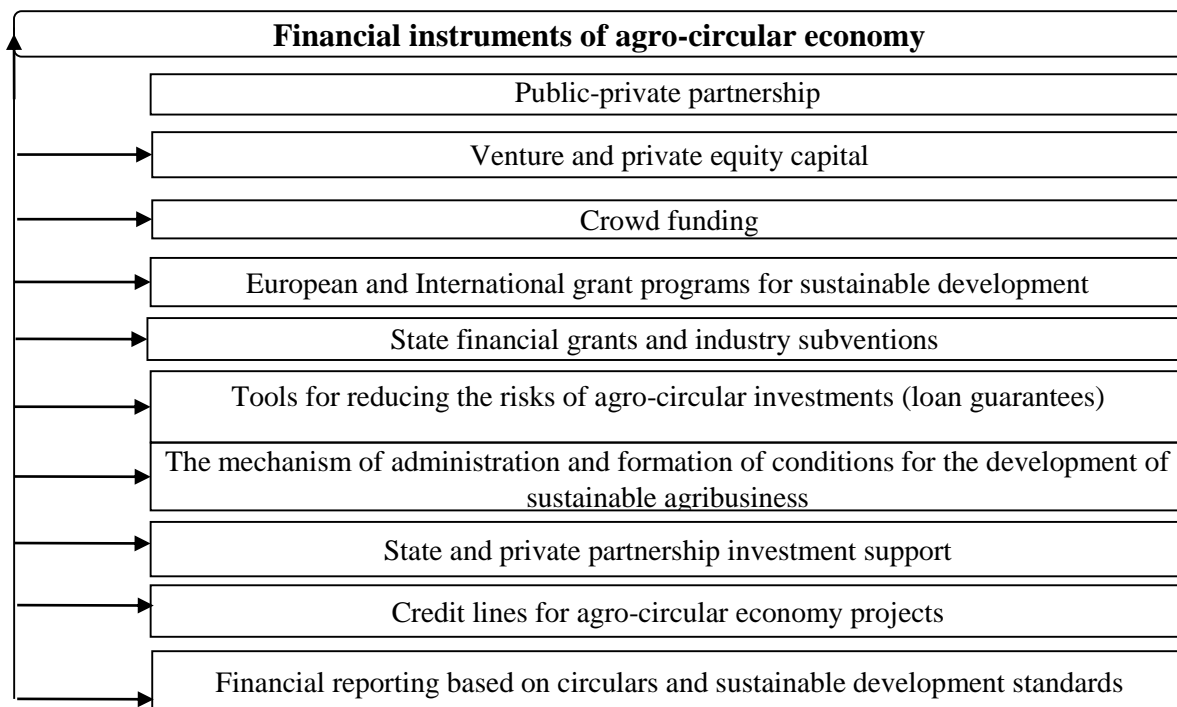
Source: Statista. Circular material use rate in the European Union (EU-27) in 2010 and 2020, by country (2022) [5]

A closed-loop agrarian economy offers significant financial opportunities to achieve the goals and objectives of sustainable development, while using the best sources of long-term value creation. Almost half of the emissions in the world are related to the processes of food production and use. The circular agricultural economy provides a powerful toolkit for ensuring global food security, preventing climate change and combating biodiversity loss. A circular agrarian economy has the properties of rapid job creation, participates in the formation of value chains and ensures the building of long-term value potential.

The experts of the Ellen McArthur Foundation indicate that the following factors can be defined as the advantages of the «circular economy» for the organization: significant saving of materials; sustainable resource use; stimulation of innovation; the ability to meet the needs of the constantly growing population of the Earth; increased recycling and reuse could generate an additional \$1 trillion for the global economy by 2025 [6].

The substantiation of effective mechanisms and increasing the amount of financial support of the agricultural circular economy today is a key prerequisite for the transition to business models of closed-loop agro-economy, which allow in the future to preserve the value of the resource potential of agriculture and increase the effectiveness of its use (Figure 5). As noted by domestic scientists, business models of agro-circular economy are not always suitable for traditional financial instruments and financial institutions. The mechanism of action of agro-circular economy models is currently determined by the increased level of risk management, they are not widespread enough in domestic practice, they have not acquired developed methods and forms of state financial support mechanisms [7].

Figure 5. Financial support tools for the development of agro-circular economy business models



Source: developed by the authors

The modern toolkit of financial support for the implementation of business models of the agrarian circular economy should be reoriented from traditional income interests to the creation of long-term social values and the preservation of natural and agricultural resources to ensure the existence of humanity. Possibilities should take into account the rethinking of the general design, agricultural production and food production, optimization of the use of technical and technological and biological resources of agriculture. The priority direction of financial support should be the transformation of agriculture into a single closed model of the agri-food sector, focused on effective management of resources, waste, preservation of biodiversity to ensure the closure of cycles of materials and resources into a single organic system.

For the financial support of the development of the circular agrarian economy, the most effective tool is crowdinvesting, which can be implemented in two main ways: through the purchase of shares in the capital of a circular agribusiness or in exchange for a part of future income (profits).

Horizon 2020 is a powerful tool of the state financial support mechanism of EU countries. The total budget of Horizon 2020 is more than 3.7 billion euros specifically for the implementation of the Societal Challenge 2 (SC2) program «Food security, sustainable development of agriculture and forestry, marine and inland water research and bioeconomy» (2014-2020). For 2014-2020 within the framework of the Horizon 2020 project, about 1 billion euros was directed to the financial support of sustainable development programs in agriculture, namely: sustainable food security, revitalization of rural areas, food and natural resources. With the help of the allocated

funds, the following tasks were solved: 1) improving the management of regional ecosystem resources; 2) ensuring healthy and full nutrition of the population of the regions; 3) environmental protection and adaptation of agribusiness to climate change; 4) development of active, green and inclusive rural areas; 5) creation of innovative chains of value formation; 6) increasing the level of digitization of agriculture and green areas [8].

An important role in ensuring an effective financing mechanism for the development of circular agribusiness belongs to the state and its institutional bodies. The key function of the state in solving this task is to provide favorable incentives for investment in the industry for closed-loop projects. In this regard, the main directions of the state's strategic influence on the processes of attracting financial flows to the implementation of agro-circular economy business models are: 1) integration of measures to accelerate organizational transformations and the transition to the principles of closed-loop economy development within the entire agro-food complex; 2) increase in financing of state programs for ensuring economic growth on the basis of circularity; 3) removal of institutional barriers and creation of a system of motivators for the implementation of circular agrarian business projects in the national economy.

The financial component of institutional support for the development of the agricultural sector and rural areas of Ukraine has always been one of the most relevant and problematic for national management practice. In particular, the share of expenditures of the State Budget of Ukraine for financing the agricultural sector was no more than 0.8% for 2015-2020. [9]. The main directions of state financial support for the agricultural sector in recent years were: state support for the livestock industry; support for the development of hops, establishment of new gardens, vineyards, berry orchards; providing loans and making them cheaper; support for the development of farms; partial compensation of the cost of complex domestic agricultural machinery. Other financial support programs included: providing loans to farms, direct financial support to agricultural producers (Table 1). The total amount of financial assistance in 2021. amounted to UAH 4,712.4 million (or UAH 418,000 per entity receiving funds) [10].

Table 1. The dynamics of the volume of financial support for the development of the agricultural sector of the economy of Ukraine, UAH million

Directions of financial support	2015	2017	2019	2020	2021
Financial support for the agricultural sector through cheaper loans	300.0	300.0	300.0	127.2	1200.0
Financial support for the development of farms	-	-	800.0	130.8	120.7
Financial support for development and horticulture, viticulture and berry growing	-	-	299.3	400.0	512.2
Financial support for animal husbandry	250.0	170.0	3500.0	1040.6	1609.6

Financing the formation of an intervention food fund	1400.0	-	-	-	-
Financial support for leasing	3.8	3.8	4.8	-	-
Partial compensation of the cost of agriculture. techniques			640.8	1456.6	991.3
Other financial support programs	30.6	4675.0	1003.1	1131.3	78.6

Source: compiled by the authors for [10]

Within the framework of institutional financial support for agriculture and rural areas of Ukraine, several promising strategic projects were agreed upon for implementation, the financing of which is carried out jointly with international organizations (USAID): «Credit resources for agricultural producers» (2016-2023), «Agrarian development» (2018-2024), which are focused on providing preferential credit resources and achieving food security and sustainable development of agriculture in Ukraine [11].

Currently, among potential investors, investing in circular economy projects, in particular, in the agricultural sector, is associated with a high level of risk and an insufficient level of profitability. To reduce the riskiness of agro-circular investment projects, the latest tools of both institutional management policy and financial support are necessary. As part of the levers of institutional policy, the primary measures are the allocation of funds for the development of the infrastructure of the agro-circular economy (systems of reuse and processing of resources, waste disposal, infrastructural facilities for the reproduction of the fertility of agricultural lands and the biopotential of animals, etc.). The policy of eco-design of food products, the policy of attracting «green» investments in the industry, optimization of the fiscal burden on agrarian business can become effective tools of the institutional policy of managing the formation and development of the agro-circular economy.

Among the instruments of financial support for agro-circular investment projects, state guarantees for loans for agribusiness, reimbursement of part of the costs associated with structural transformations, joint public-private lending and insurance, and joint investment in the authorized capital of circular agribusiness can become priorities.

The circular economy is a pillar of the European strategic «Green Course», for which the total budget provides for the allocation of about 1 trillion euro. Along with this, active financial support is provided by banking institutions: the European Investment Bank in the amount of 2.5 billion euros, the European Fund for the Biocyclic Economy together with five commercial banks of the EU in the amount of 10 billion euros. The EBRD issued «green loan» bonds for a total value of 500 million euros [7].

Financial flows from public capital raised in the form of shares related to circular business projects are increasing, and private and private debt funds focused on the development and support of circular business models are more actively being created. Despite the increased degree of risk, over

the last year the value of assets, including shares with a focus on the closed cycle economy in the EU, increased six times – from 0.2 to 2.0 billion euros [8].

In recent years, the amount of investment flows directed to the implementation of circular projects in agricultural business has increased significantly. Today, among such projects, the greatest investment demand is focused on the processing of food waste, the reuse of bio-agricultural waste, the construction of appropriate circular infrastructure facilities, investments in circular innovation projects that ensure an increase in the shelf life of food products.

For potential investors, the financing of agricultural circular economy models appears to be a venture business associated with an increased level of riskiness of the invested funds. At the same time, the agri-food sector is one of the most prioritized and popular for joint venture capital today. This is due to the following business motives for capital donors: 1) the circular economy covers all types of economic activity, but it is the agri-food sector that forms the most important value chains for human existence, the value of which will increase with the increase in the world population; 2) to a greater extent, humanity seeks to obtain safe and ecological food products, which affects health, duration and quality of life; 3) closed-type agro-food sector forms chains of value creation with maximum economic returns and profitability of advanced capital.

The growth in demand for food products, which are separate, ecologically clean and safe, causes an increase in the interest of investors in the management of food value chains, an increase in the level of competitiveness of agricultural products on the basis of cost optimization, and the efficiency of food storage methods. Food waste reduction projects (following the example of Food Lost and Waste Champions), which have already been joined by more than 40 large international corporations, are current investment resource investment programs in the world today. A promising direction for attracting financial resources to the agro-circular economy is provided by digital platforms that create opportunities for attracting traditional and venture capital, combining investments and innovations in the direction of circular transformations. Investment and innovation platforms focused on the development of closed-loop agribusiness can have a joint management mechanism, be based on the unification of interests and capital through partnerships between private participants and state institutional structures. The joint mechanism of private-partnership relations makes it possible to increase financial flows for the implementation of agro-circular business models, to provide the agricultural sector with innovations, to solve the problems of the inclusive gap in the access of producers and startups to sources of financing.

In the global practice of financing closed business projects of agro-economics, the following are among the most relevant and widespread: agro-food projects for the processing of food waste and their transformation into valuable products; equipping agricultural production with reactors that allow turning agricultural waste into eco-fuel and ecological liquid fertilizers; production and implementation in the food industry of technologies for long-term food storage; restoration of sustainable properties of agricultural land, financing of the introduction into economic practice of industrial 3-D printers capable of turning agricultural production waste into animal feed or biofertilizers. Such projects go beyond the purely agrarian economy and combine the business structure of the entire agro-product and agro-industrial complex within the framework of common interests.

Within the limits of one agro-farm, closed-loop projects can be presented following the example of the Dutch model of J. Sanders, where the following models were implemented as part of the financing of a joint project of the agricultural product chain in agriculture: Agro-Innovatieregio Achterhoek model of nutrient circulation, improvement of soil quality); Noord-Nederland (eco-landscape design, waste recycling); Mineral Valley Twente Twickel (creation of organic liquid fertilizers, improvement of water quality and restoration of arable land fertility, formation of a regional food chain, creation of added value of biomass) [9].

Conclusions and recommendations. Custom platforms used to maintain sustainable, edible backyard landscaping have gained significant popularity today. The creation and launch of blockchain platforms for agriculture and continuous digital monitoring of the condition of soils, plants, and the future harvest is especially relevant for the Ukrainian agrarian business, which is developing on the basis of the circular economy. Such a platform connects agricultural producers with capital donors, balances their interests to achieve the goals of sustainable development, aligns value chains, creates prerequisites for increasing the competitiveness of products, increasing the profitability of agribusiness and developing rural areas. An example of the action of such digital platforms in closed-loop agribusiness is the Circular Food Solution platform, which today is a catalyst for investment and innovation solutions and a tool for creating sustainable agro-food systems.

Research shows that one of the prerequisites for reducing the degree of riskiness of financing circular agribusiness projects can be the voluntary adoption and use of sustainable development standards. The optimal situation appears when the profiles of risks and sustainable investment reach an equilibrium balance. Sustainable agrarian business, of which circular agro-economics is a part, is able to provide a more reliable return on investment than traditional agricultural entrepreneurship. Agricultural enterprises that carry out their economic activities based on the principles and standards of sustainable development become more attractive for investment due to the high level of competitiveness of products, increasing the value of image capital and higher business profitability. Under such an approach, investments and standards of sustainable development of the population provide a joint synergistic effect of combining a pragmatic profitable approach and socially responsible initiatives for the benefit of the circular agricultural economy and society as a whole.

For the agricultural sector, the implementation of the circular economy is closely related to the further spread of innovative technologies of precision agriculture, biologicalization of agriculture, integrated technologies of pest control, resource-saving technologies of soil treatment, computerization and automation, etc.

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Green Infrastructure as a Component of Sustainable Development

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Abstract

One of the issues today is to ensure the sustainable development of society. Different tools are applied for this purpose. These tools allow for achieving results in a specific area of sustainable development: economic, environmental or social. However, it is more actual to use such tools that will allow for improvements in all of these areas simultaneously. An example of such a tool is green infrastructure. Over the last decade, the practical implementation of its principles in various fields of human activity has made a significant step forward in the realisation of the sustainable development concept. The article considers the main benefits of applying green infrastructure principles in enterprises. Currently, certain principles of green infrastructure are working in enterprises. It has some positive results. However, to increase the effectiveness of principles' implementation is necessary to use a systematic approach. Systematic analysis of existing environmental problems in the enterprise can help identify the causes of their occurrence and find variants of solutions. Ultimately, it will make the ecological policy of the enterprise effective and conscious. Consequently, it appears the understanding of which measures should be taken and what results can be expected. Such an enterprise strategy will provide the implementation of the sustainable development program. Moreover, the experience of applying the principles of green infrastructure at the enterprise level gives the prospect of ensuring the sustainable development of society as a whole.

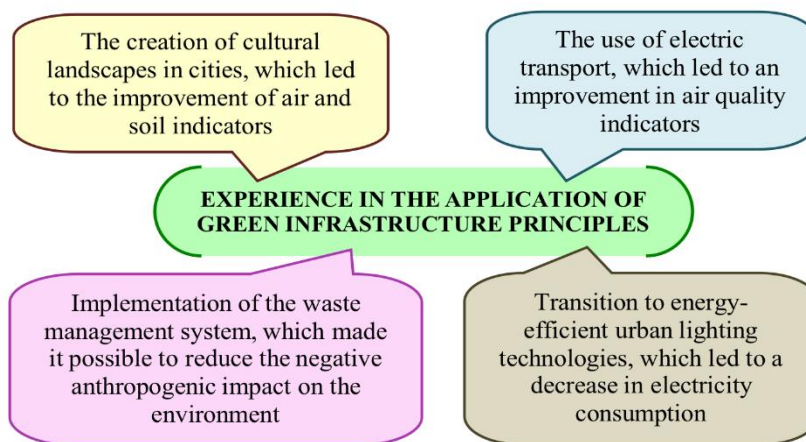
Keywords: Sustainable Development, Green Infrastructure, Environmental Policy, Eco-friendliness

Jel Code: Q01

1. Introduction

In recent years, efficient theories and concepts have appeared in the economic, social and environmental fields. Among such innovations is the green infrastructure, which quickly spread in many countries, for example, Germany, France, the USA, Canada and others [1-4]. The popularity of this concept is the positive experience of its application (Figure 1).

Figure 1: Experience in the application of green infrastructure principles



Unfortunately, green infrastructure principles are hardly applied in Ukraine [5-7] because two reasons. The first is the lack of appropriate funding, and the second is the low level of people's environmental culture. These two factors significantly inhibit the implementation of green infrastructure principles. However, if we recall one of the main ecological slogans: "Think globally, act locally", then today, in Ukraine, the green infrastructure principles can be gradually implemented within local facilities but not entire cities, for example, at enterprises. In the future, this will allow enterprises to:

1. Improve the environmental indicators of their activity;
2. Increase the level of occupational safety;
3. Gain practical experience in the application of these principles.

All these are important for applying green infrastructure principles to larger objects.

Thus, formulate a scientific problem: research and analysis of possible options for implementing green infrastructure principles at enterprises.

2. Literature review

The research and analysis of the ways of implementing green infrastructure principles at enterprises must begin with considering the concept of “green infrastructure”. It is because, as mentioned above, green infrastructure is not common in Ukraine and, therefore, does not have an established interpretation, which, in turn, will complicate finding ways to implement it.

The review and analysis of information on this issue showed that many countries apply the green infrastructure principles, which led to different definitions. Each country, which applies such principles, has its vision of the definition based on existing environmental problems that need to be solved [1-12]. Thus, each definition has certain accents characteristic of this or that city, this or that country. Consider some examples. For instance, in the USA, green infrastructure means applying a new waste-water management system, the feature of which is the use of fundamentally new vegetation, soil and other natural features of the landscape instead of traditional storm-water management measures (storm-water drains and treatment facilities) [1]. In Germany, the emphasis is on the issues of increasing the use of renewable energy (in particular, solar and wind) and waste management (sorting and recycling of waste, the use of zero-waste technologies) [2]. In Poland, the essential issue of green infrastructure is the greening of cities [10]. According to the Japanese, the main goal of applying the principles of green infrastructure is to prevent and mitigate the negative consequences of environmental disasters, reduce the emission of greenhouse gases, and education to people [12]. Canada considers preserving biodiversity, mitigating the consequences of climate change and regulating the water regime as priorities. Thus, the conclusion is green infrastructure combines many different measures that allow solving a wide range of economic and environmental problems of varying degrees of complexity, taking into account the peculiarities of the functioning of a specific city or country.

In light of this, to apply the green infrastructure principles in Ukraine, it is necessary to consider the advantages of implementing green infrastructure and highlight among them the essential elements that will constitute the content of this concept. So, the benefits of applying the green infrastructure principles in various spheres of activity are as follows:

1. In the economic sphere, the application of such innovations as the use of energy-saving technologies and increasing the share of electric transport allows for improving economic indicators and saving money.
2. In the environmental sphere, it is the support of natural parks and landscape zones in cities. These actions help to reduce the content of pollutants in the air, water and soil, etc.
3. In the social sphere, the creation of green zones in cities, which are a place for recreation and cultural events, which improves the level of social interaction among people.
4. In the medical field, reduction of morbidity rates due to improvement of the environment.
5. In the cultural sphere, raising people’s awareness of environmental issues and increasing their ecological culture.

Sum up the above and consider the peculiarities of the environmental needs of Ukrainian society, we formulated the following definition: green infrastructure is a set of measures to minimize the negative impact on the environment and people, which includes technical solutions (building, landscaping and others) and socio-psychological ones (development population ecological culture, formation of ecological needs in people, etc.) [5,13].

Tools and methodology

Specifying the concept of “green infrastructure” makes it possible to move to the next stage of work - finding ways to implement the principles of green infrastructure at the enterprise.

Among the advantages of applying the principles of green infrastructure is the improvement of the population’s health indicators [10,14]. In this case, the result appears due to improving the environment with which a person constantly interacts, not as a result of innovative achievements in medicine.

If we think by analogy, it is also possible to increase the safety of employees during work and improve their occupational health indicators by developing the environmental conditions of activity at the enterprise, that is, by applying the principles of green infrastructure. Of course, the question immediately arises: “How can it be done?”. In fact, it can be realised in different ways. If you carefully examine the existing achievements of enterprises in the field of environmental policy, it becomes evident that several principles of green infrastructure are already widely used today.

One such example is the “Green IT” technologies in enterprises. Let’s consider the content of this concept. Green IT is an environmentally responsible use of IT resources through a decrease in energy consumption and equipment reasonable exploitation [15,16]. In the given definition, “equipment reasonable exploitation” refers to a responsible attitude to IT’s selection, operation and disposal. Green IT began to develop around the mid-90s of the 20th century when the problem of the general spread of computer technologies in all areas of human activity. As a result, a significant increase in electricity consumption, the source of which is mainly non-renewable natural resources, has appeared. This fact has forced scientists and manufacturers of computer equipment to think about the improvement of technical devices to reduce energy consumption. As a result, at the beginning of the 2000s, a new problem appeared. It was related to the need to dispose of outdated models of computer equipment since the pace of updating technology was constantly increasing. Today, computer equipment works for an average of three years. After that, it is replaced. At the same time, used equipment is almost not subject to disposal, which leads to its accumulation and subsequent negative impact on the environment. Thus, the application of Green IT technologies is an example of the implementation of the principles of green infrastructure at the enterprise. However, in Ukraine, in most cases, enterprises apply Green IT partially, as they are limited only to updating equipment. Despite on this, it allows them to obtain positive results,

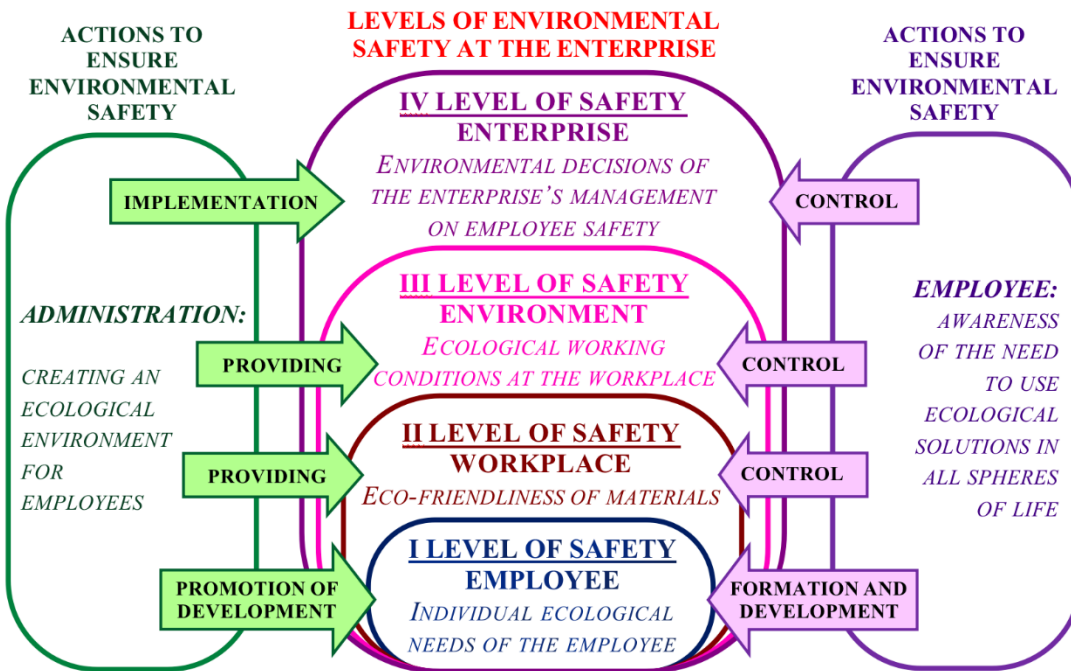
namely: reducing energy consumption, improving working conditions and increasing the safety of workers.

Another example of green infrastructure principles implementation at enterprises is the widespread use of energy-saving lighting inside and outside the premises. It allows enterprises to save money on lighting significantly. Unfortunately, in Ukraine, there are no state legislative mechanisms for the introduction of energy-saving means of lighting in enterprises and everyday life, as is done, for example, in the countries of Western Europe. State regulation of this issue could significantly contribute to increasing the effectiveness of the application of this measure.

To sum up, we have the following conclusion: today, green infrastructure principles are implemented and working partly at enterprises. However, they works not for the reasons of understanding and awareness of the importance of environmental problems. More often, it happens because of economic benefits, which decreases the possible positive results of their application. In order to increase the effectiveness of these principles, a systematic approach is needed, which will make it possible to make a comprehensive analysis of existing environmental problems at the enterprise, to determine the causes of their occurrence and mark the main ways of solving them. Eventually, it will make the ecological policy of the enterprise, above all, conscious. Thus, there will be an understanding of what measures need to be implemented and what results can be expected. To use this approach, we need to research:

1. The level of environmental safety at the enterprise, which will allow for estimating the level of environmental problems.
2. Actions that have to be applied at the enterprise to ensure environmental safety from the side of the enterprise's management and the employee.

The generalized results of the research on the enterprise's environmental safety are in Figure 2.

Figure 2: Environmental safety of the enterprise and actions on its implementation

The first level of environmental safety is the individual ecological needs of the employee. At this level, difficulties in green infrastructure principles application have already arisen since Ukraine has a low level of the population's environmental culture. It is impossible to expect an employee will monitor the eco-friendliness of materials at the workplace or evaluate the quality of the environmental solutions of the enterprise's management if he does not know what environmental standards exist, how they should be applied, etc. Moreover, there are almost no social programs that would contribute to the formation and development of people's environmental consciousness, increase awareness of environmental issues, etc.

The management's environmental policy is at the highest level of the enterprise's environmental safety. At this level, we have the same problems as in the first one – due to ignorance of many environmental issues, the applied measures are often impractical and limited only by economic benefits. Instead, it is possible to improve such indicators, for example, the level of employees' health, a decrease in a negative impact on the environment, etc.

Thus, presented in Figure 2 scheme for ensuring the environmental safety of the enterprise either works partially or does not work at all, which makes it hard to apply the green infrastructure principles. Undoubtedly, this situation needs to change. And in this case, it is possible to propose a generalized system for estimating the eco-friendliness of the enterprise [17-20]. It can be used by the employee and the enterprise's management simultaneously. It can be presented in the form

of a survey regarding the subjective assessment by workers and management of the general environmental situation at the enterprise. It will allow:

To draw the attention of employees to environmental issues and, thereby, increase their awareness.

2. To reveal the actual environmental problems of the enterprise, which will allow rational planning of costs for ensuring environmental safety considering the application of green infrastructure principles.

As a result, we will have:

An assessment of environmental problems from different positions and distribution of them according to the degree of importance.

Determination of appropriate solution options considering modern trends in environmental safety issues.

In developing a survey to assess the eco-friendliness of the working environment, it must be taken into account:

The survey must contain assertions that describe the possibility of applying a specific green infrastructure principle at the enterprise. The respondent must determine to what extent, in his opinion, this principle is implemented.

To increase effectiveness, it is necessary that the maximum number of employees engaged in various types of activities pass the survey. Therefore, the survey should contain universal characteristics of the work environment typical for most types of activities.

The counting and interpreting of the survey results should be as simple as possible and not require special knowledge, since the employee should be able to assess the environmental conditions by himself. Therefore it is suggested to use a point system.

A fragment of the survey on the estimation of the working environment eco-friendliness is in the Table 1.

Table 1: Coefficients of workplace environment eco-friendliness

№	Working environment characteristics	Coefficients of eco-friendliness, points
1	Eco-friendliness of enterprise infrastructure:	
	presence of special parking areas	5
	chaotic parking of cars	1

2	Building eco-friendliness:	
	concrete construction	5
	brick construction	4
	breezeblock building	3
3	Trash-cans and their service:	
	enough number of trash-cans and their timely servicing	5
	not enough number of trash-cans, but their timely servicing	3
	not enough number of trash-cans and their timely servicing	1
4	Rooms cleanliness:	
	indoor cleaning is done daily	5
	indoor cleaning is done one time in 2-3 days	4
	indoor cleaning is done once a week	2
	indoor cleaning is done one time in 2-3 weeks	1
∴	∴	∴

Total points:

Overall, the survey contains sixteen working environment characteristics. Each characteristic has points in the range of 1 to 5 points. 1 point corresponds to an unsatisfactory level of eco-friendliness of the working environment characteristic, and 5 points – a satisfactory level of eco-friendliness of the working environment. In the survey, the ecological coefficient for each characteristic was determined based on the results of a statistical analysis of the impact on human health. At the end of the survey, it is necessary to sum the total number of points and determine to which of the three ranges of the working environment eco-friendliness it corresponds. The ranges of the working environment eco-friendliness are as follows: unsatisfactory, average and satisfactory levels.

Approbation of the survey at the enterprise producing flexo-printed products showed the following results:

1. 47 employees completed the survey. Processing the survey results making it possible to identify two characteristics of the working environment that need improvement. These are the eco-

friendliness of the enterprise's transport infrastructure and the eco-friendliness of the furniture on the premises.

2. 92% of respondents, including employees and management representatives, rated these characteristics with the lowest points.

3. The employees assessed the general level of the working environment eco-friendliness as satisfactory.

4. Among the green infrastructure principles for increasing the enterprise's environmental safety, the employees chose rational planning of parking zones, which will allow reducing emissions of combustion products and noise load. In addition, it will make it possible to use the territorial areas of the enterprise more rationally.

Thus, the identification of existing environmental problems at the enterprise, even through the use of a general survey of employees on their vision of the ecological safety of the working environment, allows us to determine which green infrastructure principles can be applied to improve it. At the same time, improvements can be achieved not only in environmental issues but also in the field of occupational safety at the enterprise and the occupational health of employees.

Conclusions

To sum up the above, we have the following conclusions:

The concept of "green infrastructure" is an attempt by modern society to implement a comprehensive approach to solving the problem of minimizing any negative impact on people and the environment. The implementation of green infrastructure principles is carried out through the application of various practical measures of technical, social, economic and cultural direction at the level of cities or even entire regions.

The concept of green infrastructure is rapidly spreading in the world. Unfortunately, in Ukraine, these principles are implemented slowly. The main reasons for this are the lack of funding for ecological projects and the low level of ecological culture of the population.

Of course, the implementation of the principles of green infrastructure requires significant capital investments. However, it is possible to start applying them from smaller-level objects, for example, enterprises. It will improve the quality of the company's activities in the field of its environmental policy, increase the level of occupational safety and improve the occupational health indicators of workers, and gain practical experience in applying the principles of green infrastructure.

Research on possible options for implementing the green infrastructure principles in Ukrainian enterprises showed that some measures are implemented at enterprises already. For example, using energy-saving lighting technologies, Green IT technologies, etc. However, these are separate and non-systematic actions, which, eventually, give a smaller result than can be expected.

To optimize the application of green infrastructure principles at enterprises, it is necessary to apply a systematic approach. It will make it possible to analyse current environmental problems at the enterprise, determine the causes of their occurrence and indicate the principles of green infrastructure that can be applied to their solution. At the same time, it will also contribute to the formation and development of ecological awareness among employees.

A systematic approach to green infrastructure principles at the enterprise is proposed to be realized as the survey, which contains questions about the environmental aspects of the working environment organization. The survey is unified to cover as many employees as possible.

The approbation of the survey at the enterprise of flexo-printing products made it possible to identify environmental issues that, according to the employees, are of primary importance and the green infrastructure principles that can be applied to solve them.

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Financial support tools for the development of business models of agro-

Travel and Tourism sector in circular economy

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Abstract

Tourism has an important role because of its economic, social and environmental potentials and implications. This industry needs to be continuously dependent on different sources like assets, environment, commodity value chains and transport industry. Tourists by themselves use local transports, consume foods, and choose to be accommodated, visit the country, take part in different activities and then travel back. This process tends to be compatible with circular economy, which is the best alternative to the linear economy, because it helps to extract the maximum value from resources while in use, recovers and regenerates products at the end of each life.

The circular economy seems to offer new ways of doing business in the travel & tourism sector, especially after the Covid-19 crisis. The main aim of this paper, is to offer a better understanding of the linkage between travel and tourism sector and circular economy. Supporting this analysis, this paper shall describe some good practices and examples of circular travel and tourism economic models.

Keywords: Travel, Tourism, Circular economy, Resources, Economic models

Jel Code: Z32, F64, O14, Q56, L15

Introduction

The future is circular.....

Tourism is considered as the largest industry around the whole world. According to the World Travel & Tourism Council, in 2020 tourism provided 1/11 of the total jobs number all over the world, by generating economic impacts of 5.5 % of the global GDP [1] . The COVID-19 crisis hit the tourism sector very hard, with direct effects on jobs and businesses, influencing negatively the economic growth. Even though, travel and tourism sector has suffered a lot from Covid-19 crisis, it still has an important role in the economic recovery. This sector risks to be among the last sectors of the last recover, but after Covid-19 crisis, tourism is facing another challenge: contributing toward circular economy. According to EIU report “ *Tourism Outlook 2023*”, [2] the global tourism arrival will increase by 30 % in 2023, but due to economic downturn sanctions on Russia and China’s zero – Covid strategy, it’s recovery will be delayed.

Trends and challenges affecting the industry’s approach and viability in the medium and long term, are not limited to the implications of COVID-19. In a post Covid-19 recovery situation, there is a need to address the environmental impacts associated with tourism activities with the main aim: regenerating natural capital. The circular economy holds big potentials for tourism businesses in reaching higher sustainability and profitability, not least related to the provision of accommodation, food and spa services and the related material flows of energy, foodstuffs, water etc. The scope of the circular economy is a systemic transformation and therefore has the potential to transform production, services and consumption within entire value chains and across different value chains, thus closing resource loops in all economic activities [3]. According to Sorin and Einarsson [4], a circular economy can be defined as a purposefully designed “socio-economic system inspired by natural systems, regenerative of human and natural capital that works long term for all stakeholders”. Circularity in tourism means and represents a strategic approach in minimizing environmental (which are mainly negative) impacts such as waste generation and CO₂ emissions.

Circular economy can be seen as an important component of tourism businesses, tourism destinations and tourists. For tourism businesses, it works in terms of competitiveness in innovation, income diversification and of investor and governmental policies. For tourism destinations, it brings the opportunity of generating wellbeing through job creation and creation of businesses chain. For tourists, it aims to enhance the awareness of traveling with purpose.

Overall, the circular economy seems to offer new ways of doing business in the travel & tourism sector, especially after the Covid-19 crisis. The main aim of this paper, is to offer a better understanding of the linkage between travel and tourism sector and circular economy. Supporting this analysis, this paper shall describe some good practices and examples of circular travel and tourism economic models.

Linkage between Travel and Tourism sector and circular economy

According to the United Nations World Tourism Organization, the impacts developed from the tourism industry can be categorized as economically, socially and environmentally ones. Tourism and travel activities are associated with significant positive global economic impacts as well as jobs and revenue creation in local destinations, but it is also an industry with a complex relationship with environment, mainly with negative environmental and social impacts such as:

increasing waste generation such as solid waste and littering; sewage; oil and chemicals;

noise pollution;

pollution like air emissions;

development of tourism industry puts pressure on natural resources especially when the consumption increases in areas where there is a limitation of resources. The linear model of producing and consuming, exhausts the natural resources.

forms of visual pollution.

The hospitality and tourism sector has been subjected to public criticism for failure to properly address environmental and global warming systems. This particularly pertains to the air travel industry [1]. Actually, economies of many countries are linear based model assuming an unlimited supply of natural resources and unlimited environmental capacities to absorb pollution and waste quantity. Linear economy generally consists in three phases: take – make – dispose, which means taking raw materials from the earth, use them to produce and sell products, and after they have reached the end of their life, we dispose them especially in landfills. It is an economic model, which has been demonstrated to be unsuitable for consumption of resources and its environmental impact.

Under the linear economic pattern, the excessive pursuit of economic growth in tourism has aggravated the environmental degradation [1]. But, in reality these assumptions cannot “resist”, especially in nowadays, where resources are going toward a “big” scarcity. It also demands never – ending growth for its survival, which cannot be real in the natural world. This model has been

the main driver of global warming, creating an existential crisis for humankind. The transition towards a circular economy means gradually forsaking the linear approach of ‘extract-produce-use-discard’ which predominates in decisions on the production and use of goods and services, and to forge a new vision that supports maintaining the functional value of the materials for as long as possible, and with a clear commitment to minimizing both the pressure placed on the resources and the generation of waste. In recent years the promising notion of a “circular economy” has emerged to address this crisis. A circular economy Action Plan has been adopted by the European Union, for example, which encompasses reimagined product design, reverse logistics and waste management [5]. In December 2015, European Commission adopted a Circular Economy Package consisting on a set of laws and actions designed to guarantee a more resource-efficient future for Europe. This package introduced a number of actions such as:

To reduce food waste

To develop quality standards for secondary raw materials

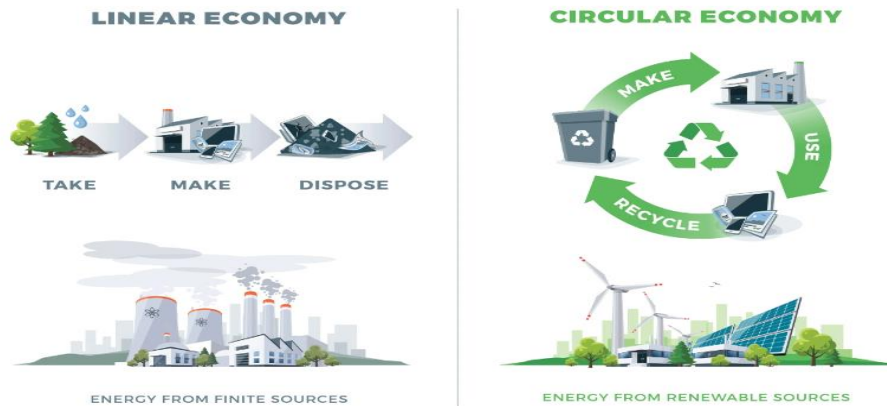
To promote reparability, durability and recyclability of products, in addition to energy efficiency

To have a strategy of plastics addressing issues of recyclability, biodegradability, the presence of hazardous substances in plastics

To take a series of actions on water reuse

“Circular Economy” model aims to generate environmental benefits, rather than negative impacts, turning waste into raw materials and energy, cost minimization and low prices in market. This concept aims to create and use a new model, not linear economy, moving from “take, make and dispose” to the principle of ‘close the cycle of life’ of products, services, waste, materials, water and energy, rethinking waste as new resources capable of being reused in the system. The figure below, explains the differences between linear economy and circular economy.

Figure 1: Moving toward circular economy



Source: IDB “Improving lives” [6]

The first model is based on the actions of take, make and then dispose, generating a large quantity of waste and large efforts to manage them. The second model tend to use the waste in processes that their final output has law materials. According to Kirchherr et al. (2017) [7], a circular economy describes an economic system based on business models which replace the end-of-life concept with reducing, alternatively reusing, recycling and recovering materials, in production/distribution and consumption, thus operating at the micro-level (products, companies, consumers), middle-level (eco-industrial parks, supply chains), and macro-level (city, region, nation and beyond) with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity to the benefit of current and future generations.”

Some benefits of Circular economy:

- Protects environment;
- Gives benefits for local community;
- Drives employment growth;
- Promotes resource independence;
- Reduced emissions;
- Protects human health.

Seven principles of circular economy [8]:

Reduce: change our consumption habits towards a more sustainable model.

Recycle: use what you can as raw materials to produce new products.

Recover: use the existing products for other purposes.

Redesign: designing products that need fewer raw materials and generates less waste.

Reuse: reusing products with the aim to extend their lifecycle.

Repair: which avoids the use of new raw materials and saves energy.

Renovate: updating old objects to be reused as vintage.

Tourism, has not a good sustainability reputation because of waste generation and pollution, but despite the negative impacts, there is a raised awareness that tourism has potentials to move toward a circular economy, contributing to all 17 sustainable Development Goals approved by the United Nations in 2005 and to be achieved by the year 2030, especially in inclusive and sustainable economic growth, sustainable consumption and production, and the sustainable use of oceans and marine resources, sustainable and modern energy and action to combat climate change and its impacts. Many destinations promote sustainable tourism and this can help to educate people about the environmental impacts of tourism. There are also some physical impacts deriving from the development of tourism industry and tourists activities such as roads, buildings, marinas, tramping, anchoring, cruising and diving. The travel and tourism sectors are dependent on agriculture, food, the built environment and transport for its resource flows, assets and commodity value chains. All these dependencies can follow circular economy principles and should do. Girard and Nocca [9] consider the circular tourism sector as its capacity to trigger and stimulate circular flows, aiming to conciliate the tourism sector and sustainable resource management, respectively. Facing also the Covid-19 period, the travel and tourism industry has an urgency to be a sustainable tourism industry development, interested in respecting natural and local social ecosystems, but this needs complex strategies and government support. Circular economy, tends to create and develop a sustainable tourism. According to UNWTO, sustainable tourism is that type of tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities [10]. Therefore, sustainable tourism should take into account the fact of making optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity, respecting the socio-cultural authenticity of host communities, conserving their built and living cultural heritage and traditional values, and contributing to inter-cultural understanding and tolerance, ensuring viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation. There is a need to implement some trends

that reflect a rapidly growing need for travel and tourism actors to respond to global sustainability challenges and to reduce their own impacts [4].

Business sector can have benefits by adopting circular economy, especially in:

reducing the possibility of rising energy and resource prices,

reducing the amount of materials and energy required, reducing in this way costs from purchases.

stimulating innovation,

Improving brand image: Tourists, are becoming increasingly aware of environmental impacts

Strengthening existing markets by redirecting your strategy to local tourists in search for sustainable destinations may provide you the resilience you need to keep on generating value

Increasing customer loyalty and more stable revenue streams

Reducing environmental impacts: reducing energy consumption, using green energy, reducing their fresh water consumption, etc.

Supporting the local communities

Allowing the maintenance of the added value of products for as long as possible and minimize waste

Increasing the comfort of staying indoors

Increasing business profits and supply security

Adopting circular economy. Some best practices

A circular economy has been considered a tool to dissociate economic development from environmental degradation [11]. According to Vargaz Sanchez (2021), the tourism industry has a significant role in the ongoing economic transformation because it has a multiplier effect on the whole economy and can encourage circular flows among its suppliers and customers. Circular economy has a significant potential in tourism industry, in the direction of changing value chain around the construction, operation, design, renewal and repurposing of facilities. There are some manners to contribute in circularity, such as decorating and furnishing hotel's interior from recycled materials, by environmentally friendly materials designed to be easily dismantled and recycled (carpets, ceiling, etc). Another opportunity is leasing than purchasing equipment such as coffee machines and renting sheet towels by eco labeled laundries.

In many countries around the world, tourism represent a high percentage of their GDP and as population enters the middle class income bracket, the more interest is for travel. Creating and developing sustainable and circular tourism, it means to take into full consideration its current and future economic, social, resource and environmental impacts, addressing the needs of visitors, the industry, the environment, host communities while managing all the resources that contributes to the tourism industry. Even though, circular concept in tourism industry is a new concept, a lot of tourism providers have approached and implemented this concept. The transition to the CE moves us beyond minimizing our emission from our current extractive linear economic system [12]. Practical implementation can have numerous challenges and problems. Sustainable tourism indicates several different principles that can be implemented to the entire tourism industry. Some of the concepts could include [13]:

new models of production and consumption of water, food, and energy;

using circular economy model to minimize and reuse the waste;

conservation of the biodiversity and the environment by using the biodegradable products;

creating cultural values by preserving the culture;

greening the tourism industry by creating a condition to make tourism economy for low income generating group.

In this paper, we shall describe some best practices in accommodation and air travel sector according to some circular principles:

Table 1: Some best practices (accommodation providers) according to circular principles

Principle	Categorization by R's	Practices
	Recycle	Manotel Hotel in Switzerland: This hotel took the initiative of recycling used soaps by a specialized machine as well as transporting them using an environmentally friendly way, by bike.

1.Design out waste and pollution	Reuse	<p>Novotel Hotel, Warsaw: This hotel took the initiative to raise employee’s awareness about some small ways to reduce food waste.</p> <p>Scandic Hotels explain on their website that the possibility for guests to only have fresh towels if they leave the used ones on the ground.</p>
	Refuse	Hotel Metropole, Montecarlo: This hotel took the initiative to ban plastic straws from all 7 food and beverage outlets.
	Recovery	<p>Airbnb, Fairbnb, Peerby: Use and life extension models</p> <p>Such a model is based on sharing or leasing products and space.</p> <p>Leasing creates an incentive for companies to recover the products and materials and get repeated value from them, while offering consumers the service they want, and assuring them of minimal waste</p>
2.Keep materials in use	Reuse	Ibis Hotel, France: This hotel took the initiative to do an inventory of furniture that they do not need to use anymore and display them to an online platform listing the items to be discarded and then to distribute them to the interested people.
	Reduce	Thon Hotels, Norway: This hotel took the initiative to collaborate with Too Good To Go. Via this app, hotels can resell surplus food form buffet.
	Relocate	Yellow Square Hostel, Rome: This hostel took the initiative of following the collaborative consumption perspective by proposing series of activities and events involving local inhabitants.

3. Regenerate natural systems	Redesign	Village Nature Paris: A zero carbon emission resort
	Reduce	Best Western: This chain took the initiative to provide a transparent understanding of the environmental impact of its activity, by taking an inventory of all used furniture, dishes, food, laundry.
	Reuse	Crowne Plaza Copenhagen Towers: Innovation in the built environmental and digitalization, built with the purpose of using sustainability as a competitive edge over other hotels (Heating and cooling system, smart booking, solar panels, reuse of food waste)
	Reduce	Green Solution House: Solar cells integrated into the facades and glazed ceilings generate electricity and an on-site pyrolysis plant converts organic waste into electricity and heat.

Source: Centour and Cirtoinno Project [14] [15].

An important role play also travelers all around the world. The travel industry is crucially dependent on the health of local communities, environments, and cultures. As many experts note, we need to invest in the resiliency of places affected by over tourism and climate change to achieve sustainable tourism (National Geographic). Nowadays, there is a need to travel in a sustainable manner, which means to travel in an eco-friendly way. Sustainable travel should be the only way we travel. From excessive air travel that causes harmful CO₂ emissions to package holiday resorts that are built on natural areas, international travel and tourism are far from sustainable. According to Stefania Angeli [16]., there are some strategies to implement in order to be a sustainable traveler:

Staying in eco-friendly accommodations, which aims to reduce the impact of tourism on the environment. Ecobnb is a platform that allows travelers to find and book sustainable tourism accommodations.

Making optimal use of environmental resources which preserves natural heritage and biodiversity. Traveling slow minimizes the impact on the environment and saves money. It can be done by using train and enjoying the scenery.

Using public transport, the number of cars on the roads which decreases and releases less carbon dioxide into the atmosphere.

Interacting with locals and buying food from them because it preserves traditions passed from generation to generation and empowers the local economy.

Not using plastic things.

Travelling in a sustainable manner influences not only environment, but also social and economic aspects:

By supporting local culture, cultural heritage we support local community and society as well as local economy. In this manner, the money spent on travel in a certain country remain within its borders.

It also allows travelers to be more conscious regarding their choices.

It promotes the development of new businesses in the tourism sector.

It economically revives rural areas in places where tourism takes place.

It improves the quality of life of the local population, both economically and socio-culturally.

Conclusions and challenges

This paper, is to offer a better understanding of the linkage between travel and tourism sector and circular economy. Moving from a linear to a circular economy, it is challengeable in the meantime very profitable. Implementing circular models, travel and tourism sector shall profit in terms of environmental benefits, loyalty, innovation, revenues, etc.

There is an increase in examples of accommodation and leasing industry, spa and wellness industry, food and restaurant industry that are moving toward circular economy. Analyzing the same industry, but different businesses, we arrive in conclusion that even though the same activity,

there are different ways of implementing aspects of circular economy. Very important is the fact of finding the best ways of implementing circular economy in travel and tourism, in all levels: macro, micro and organizational levels. Challenges of implementing circular economy in travel and tourism:

Macro environmental level: political, economical, social, technological, environmental, legal

Micro environmental level: value chain, infrastructural

Organizational level: Structure, strategy, culture, customer segment, customer relationship, value proposition, key partners, key resources, revenue stream, cost structure.

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Big data opportunities and challenges in the new competitive world

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Abstract

Nowadays, increasingly we are encountering scenarios in which it is crucial to know the actual circumstances in order to make the best decision to survive the present competitive market. To achieve this goal, the amount of data stored around the world has experienced an exponential growth, known as the "Big Data" phenomenon. Therefore, modern approaches are necessary in order to deal with this ever-growing set. Currently, Hadoop is an extremely popular tool in this sphere. However, despite Hadoop fulfilling its purpose perfectly, it remains limited in data processing in default piles and is hence not considered an advisable method for the processing of data that is updated periodically and that needs real time processing of the total set.

In stream processing, more than the notion of volume, it is the notion of speed that has a defining role. The rate at which new data is generated and therefore needs processing can be extremely high. Hence, state-of-the-art hardware and software are required for coping with such a high rate of information stream. Storm is a contemporary technology that makes it possible to process such substantial amounts of information. This open-source technology serves real-time data processing as much as Hadoop serves to process data in predefined batches. In this paper the analyze Storm in detail and identify both the advantages and disadvantages of this technology, exploring the state-of-the art real-time data stream processing.

Keywords: Big data, Open Source, Real-Time Processing, Storm, Decision Making.

Jel Code: Jel O1, Jel O3, Jel L86

1. Introduction

Nowadays, with almost any industry getting more and more competitive, chances are for an enterprise to survive, it should be living on data. Back in 2017, The Economist reported that the value of data had surpassed that of oil for the first time ever. [1] This indicator had a huge impact on organizations shifting to new business models based on data and adjusting their operations accordingly. In a study sponsored by Seagate Technology, IDC forecasts that the total volume of data will hit 175 zettabytes by 2025, a behemoth growth of 80% from the current total that will be fueling the next industrial revolution. [2] In line with this, Statista reports that there has been an exponential growth in enterprise spending on cloud and data centers from 2009 to 2021, topping at \$276.05 billion. [3]

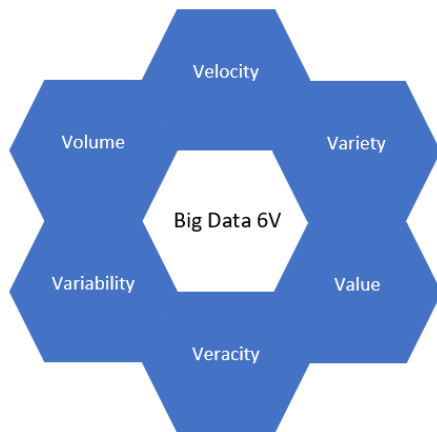
Moreover, in order to be compliant with new regulations and pressured by media and civil society, many present-day enterprises are also adopting a different economic paradigm which translates to the circular economy. This new standard according to Mitchell (2015) emphasizes keeping resources in use for as long as possible as well as extracting the maximum value from products and materials by using them for as long as possible and then recovering and reusing them.[4] The new concept is also being pushed by the European Commission which in March 2020 adopted the new circular economy action plan (CEAP) [5] as an addition to its efforts for a sustainable growth. CEAP guidelines product design, circular economy processes, waste management and urges sustainable consumption. As a result, modern enterprises are being forced towards efficiency and better decision-making which can be achieved by utilizing the information they possess. However, according to HFS Research, 75 percent of business executives still do not have a high level of trust in their data and 70 percent do not consider their data architecture to be “world-class”. [6] These findings suggest there is a clear need not only for storing and processing data for periodic executive insights but having them in real-time is a must for the business to stay afloat.

2. Related Work

Today, "Big Data" is commonly used internally in many organizations to refer to competitive advantage. There have been remarkable thoughts from both industry and academia on the "Big Data" definition [7]. Big Data is identified as the increasing flow of various types of data from different resources [8]. The Statistical Analysis System Institute (SAS) defined Big Data as “a popular term used to describe the exponential growth, availability, and use of information, both structured and unstructured” [9]. The researchers have defined Big Data concepts from different point of views (Big Data characteristics, technology, business, Innovation, etc.). One of the definitions had been updated by Gartner in 2013, who defined Big Data concept as “high-volume, high velocity and/or high variety information assets that demand cost-effective innovative forms of information processing for enhanced insight, decision making, and process optimization” [10,11,12]

Big data is a term that describes large volumes of high-velocity, complex and variable data that require advanced techniques and technologies to enable the capture, storage, distribution, management, and analysis of the information. [13] Under this definition, the well-known "3V" model (Volume, Velocity, Variety) by Gartner, a global research organization, can be used to summarize the characteristics of big data. [10,11,12, 14] However, a more recent study, expands this model to 6V's which is being generally accepted. [15] Figure 1 shows a representation of the 6Vs of Big Data.

Figure 1. 6V's of Big Data



Source: H. Rahman, S. Begum, M. Ahmed, "Ins and Outs of Big Data: A Review" (2016)

Looking at the 6V model from H. Rahman, S. Begum, M. Ahmed we can specify as Big Data a set of data that boasts the following characteristics:

A. Volume

Volume describes the amount or magnitude of the data. Massive volumes of data are held by companies such as Twitter, Meta and Google, which presents new issues for storing, retrieving, analyzing, and processing this data. Manipulation and transferring of data have altered as a result of using big data rather than conventional storage.

B. Variety

Variety refers to the diverse kinds of data that are being produced. Structure, which allows us to distinguish between structured, semi-structured, and unstructured data, or processing volume, as in batch versus stream, are two characteristics that can be used to quantify variety.

C. Variability

Data that is unstable, challenging to manage, and cannot be dealt with easily is referred to as variable data. For researchers, explaining variable data represents a considerable challenge.

D. Velocity

Velocity is the rate at which Big Data is produced for manipulation, exchange, storing, and analysis. Due to the significant associated costs, velocity poses new research problems for data scientists. If the user needs to retrieve or manipulate data but the operation takes too long, the data is left behind.

E. Veracity

Veracity is known as the consistency of the data being processed. The veracity of the data source is therefore determined by the precision of the data. As a result, data precision determines the data veracity.

F. Value

Value describes the objective or business result that the data contributes helping with decision-making.

3. Tools and Methodology, leveraging the potential of Hadoop to real-time Big Data

Hadoop is a technology that meets the needs of big data. It is horizontally scalable and designed as a software framework for processing very large amounts of data [16]. Hadoop is an open-source implementation for Google MapReduce and is based on the simple programming model MapReduce [17]. The Hadoop software is part of the Apache project and is a framework written in Java for scalable, distributed software [17].

While Hadoop is clearly the most popular Big Data framework, Storm has become nowadays the gold standard in the real-time processing industry of data. This technology was initially created by Nathan Marz while employed at Black Type, a social analytics firm that Twitter eventually bought. As data analysis in Hadoop and Spark took too long to analyze, this technology was created to fill in these gaps (despite MapReduce excellent processing capabilities). The introduction of Storm influenced how experts dealt with large-scale analytics, resulting in the rise of stream processing and real-time analytics.

Storm [18] is an open-source framework for processing large structured and unstructured data in real-time. Storm is a fault-tolerant framework that is suitable for real-time data analysis, machine learning, sequential and iterative computation.

Below listed are the main criterion, on basis of which one can decide when to use Apache Storm [20].

- Fault tolerance: High fault tolerance
- Latency: Sub Seconds
- Processing Model: Real-time stream processing model
- Programming language dependency: any programming language
- Reliable: each tuple of data should be processed at least once
- Scalability: high scalability

Today, the volume of information in Internet increases exponentially, especially that of interest for the media. For example, in the case of natural disasters, social or sportive events, the traffic of tweets or messages may rise to 10 or 100 times with respect to the number of messages in a normal situation (Ranjan 2014) [19].

In this paper we analyze Storm, a tool for real-time Big Data analysis, and identify both the advantages and disadvantages of this technology, exploring the state-of-the-art real-time stream processing for companies adopting it.

4. Jumping into the Storm

4.1. Architecture

Storm has a master/slave architecture similar to Apache Hadoop.[24,25] That is, Storm's Nimbus and Supervisor correspond to Hadoop's master and slave, respectively. As A. Jain describes in his book "Mastering Apache Storm", Apache Storm is a master-slave architectural design made of four components. [21]

More specifically:

- **Nimbus:** Nimbus: The Nimbus node acts as the master in a Storm cluster. It is responsible for spreading the application code across numerous worker nodes, assigning tasks to various machines, monitoring any errors, and restarting processes, as necessary. Nimbus is stateless and stores all its data in ZooKeeper. There is just one Nimbus node in a cluster of Storm nodes. The passive node will turn into an active node if the active node fails. The active Nimbus is designed

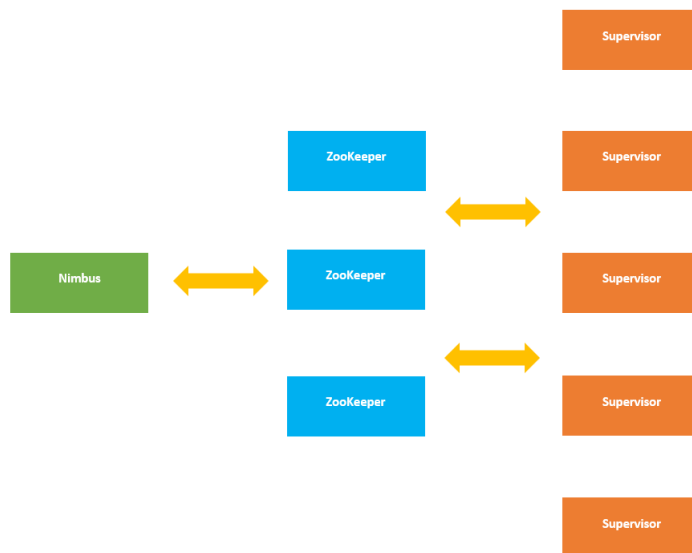
to fail rapidly, so if it does, the passive node will take over as the active node or a restart can be performed in the down node with insignificant effect on the tasks now being completed on the worker nodes. In contrast, if the JobTracker breaks in Hadoop, the state of all running jobs will be unstable and a restarted would be required. The Storm workers can continue to function normally even if all of the Nimbus nodes fail, but the user won't be able to add any new jobs to the cluster and it won't be possible for the cluster to move the failed workers to another node.[21]

- **Supervisors**, in a Storm cluster, worker nodes are known as supervisor nodes. Each supervisor node runs a supervisor daemon, which oversees spawning worker processes and initiating their start, stop, and execution in order to complete the tasks given to that node. A supervisor daemon is fail-fast, just like Nimbus, and keeps all of its states in ZooKeeper so that they can be restored after a restart without erasing any data. On that machine, a single supervisor daemon typically manages several worker processes.[22]

- **Zookeeper**: Every distributed application needs a number of processes to interact with one another and share certain configuration information. An application called ZooKeeper offers each of these features in a trustworthy manner. Storm utilizes a ZooKeeper cluster as a coordinated application to manage numerous tasks. ZooKeeper serves as a central repository for all cluster-related statuses and Storm-related tasks. ZooKeeper is the way of communication for nimbus and supervisor since they do not interact together directly. Because all data is stored in ZooKeeper, Nimbus and the supervisor daemons can both be quickly terminated without damaging the cluster.[25]

Figure 2. represents a Storm Cluster and its components.

Figure 2. A typical Storm Cluster



Source: Authors work

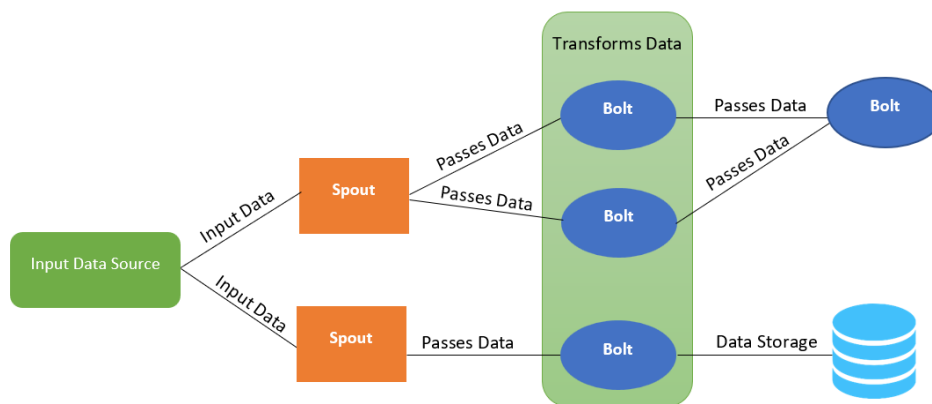
4.2. Data Model

Tuples and streams make up the data model of Apache Storm.

- **Tuple:** A single message or record that travels between different instances of a topology.

- **Stream,** serves as the core abstraction in the Storm ecosystem. An infinite series of tuples can be handled in parallel by Storm as a stream. A single bolt component or an array of bolt types can handle each stream. Storm can be viewed as a framework for stream alteration as a result. Streams are shown in Figure 3. by arrows. The bolts can make and consume tuples from each stream in a Storm application according to the ID assigned to it. Additionally, each stream also has an associated model for the tuples that it will process.[21,22,25]

Figure 3. Storm data model along with its building blocks



Source: Authors work

4.3. Building Blocks

The logic of a Storm application is baked into the topology. The topology is made up of spouts and bolts.

- **Spouts:** In a Storm topology, a spout is the source of tuples. It is in charge of reading data from external sources or listening for incoming messages in a queue, for example, and publishing that data—or emitting, in Storm terminology—into streams. A spout is capable of emitting many streams, each with a unique schema.[22,25]

- **Bolts:** A bolt transforms streams and is the central processing unit in a Storm topology. The tuples should be transformed just by one bolt in the topology, and many of these bolts can work together to reflect a complex transformation.[21,22]

5. Storm Use Cases

5.1. Benefits of the technology

While real-time processing was a growing trend in panel discussions between business intelligence and data analyst professionals, Apache Storm evolved with all the capabilities required to speed up conventional operations. Here, we examine the qualities that made Apache Storm an ideal choice for real-time processing. [21, 22]

- **Fast:** It has been said that each node of Storm can process up to one million tuples or records per second.

- **Horizontally scalable:** While speed is a must for creating a platform for high volume/velocity data processing, a single node has its limitations when it comes to the myriad of events it can process per second. A node is represented by a single machine in the system that runs Storm applications. Because Storm is a distributed platform, you can expand your Storm cluster and boost your application's processing power. Additionally, it is linearly scalable, allowing you to double the number of nodes while maintaining the same processing capacity.

- **Fault-tolerant:** Worker processes in a Storm cluster perform units of work. If a worker dies, Storm will restart it on a different node in the cluster. If the worker's operating node dies, Storm will restart the worker on that node.

- **Data processing is guaranteed:** Strong guarantees are provided by Storm that any message entering a Storm process will be processed at least once. Storm will repeat any failed tuples or records in the event of a failure. Additionally, it can be set up to only process each message once.

- **Simple to use:** Storm is straightforward to implement and manage. After deployment, the cluster needs little upkeep.

- **Programming language not dependable:** The programs that run on the Storm platform can be built in any programming language that can read and write to common input and output streams, even though the Storm platform runs on the Java virtual machine (JVM).[24]

5.2. Market Adoption

Because Apache Storm thrives in huge data contexts, it frequently acts as the foundation for dependable data streaming in businesses, delivering speedy insights and outputs.

Several prominent use cases include:

- **Spotify**, makes use of Storm for several real-time functions, including targeting, analytics, monitoring, and recommendation systems. Storm allows for a fault-tolerant, low-latency distributed system when combined with other technologies like Kafka and Cassandra.

- **Twitter**, uses Storm in both production and testing environments. Real-time analytics, revenue optimization, discovery, and personalization are some applications.

- **Flipboard**, is a single location where you can browse and save all of the news that interests you. At Flipboard, systems like Hadoop, ElasticSearch, HBase, and HDFS are used with Apache Storm to build incredibly extensible platforms. Here, Apache Storm is used to provide services like content search, real-time analytics, bespoke magazine feeds, etc.

- **RocketFuel**, is a startup that uses artificial intelligence to scale increase marketing returns on investment in digital media. Using Storm, they are developing a platform that would provide real-time tracking of impressions, clicks, bid requests, etc. This platform is designed to function by copying crucial Hadoop-based ETL pipeline workflows.

- **Infochimps**, uses Storm as a source for Data Delivery Services, one of its cloud data services. It makes use of Storm to offer cloud services for data gathering, transmission, and sophisticated in-stream processing that could be linearly extensible.

- **Wego**, is a metasearch engine for travel that was developed in Singapore. Here, data arrives at various times from all across the world. Wego is able to find real-time data, address any corresponding issues, and give the best results to the user with support from Storm.

- **WebMD**, makes use of Storm in a mobile setting for real-time updates and NLP (natural language processing) workloads. ETL and marketing pipelines are examples of internal applications.

- **NaviSite**, is using storm in its event log monitoring and auditing system. Every log that is produced by the system will pass through Storm. If there is a match, Storm will save that specific message to the database. If not, it will check the message against the collection of regular expressions that have been preset.

6. Storm limitations

Although Apache Storm is commonly viewed as an innovative framework in the field of distributed stream processing, unfortunately, it is less well-known than competing frameworks. This is mostly caused due to the following fundamental constraints.

- API

Most competitive technologies offer the creation and use of SQL-like APIs for their underlying frameworks, such as the Spark SQL & Dataframe API and the Flink SQL & Table API. Development efficiency and framework adoption are directly affected by such API connections and support. Storm SQL is still in its infancy despite being around for a while.

- Time management

Advanced stream processing relies heavily on the principles of time management, particularly event time and processing time. Unfortunately, event timing is not a feature that Apache Storm officially supports out of the box. This has hugely impacted this technology from being embraced by the mass tech community.

- Windowing

Windowing and support for window-based aggregations are two more essential features of stream processing. To do this, the underlying framework must provide a precise description and support for temporal semantics. As was already established, Apache Storm has little to no support for event-based time management, which directly correlates to windowing methods not being present in Apache Storm.

7. Conclusions

Prior to Storm, worker thread architectures and queues were used to manage real-time data. These patterns included queues that were constantly writing data and others that were reading and processing it on a regular basis. However, this structure was not only quite delicate, but it also fell short of real-world situation requirements. Instead of doing the work itself, a lot of effort would be spent handling data loss, maintaining the entire system, and serializing/deserializing messages.

8. Recommendations

Apache Storm is an innovative technique to transmit the data as Spout and Bolt and the remaining processing as Topology is through. For real-time data analysis, Apache Storm is a well-known, open-source stream processing computation framework. It is already being used by many firms.

Since the introduction of Storm, a lot of the problems regarding real-time data computation were addressed. This technology helped in paving the way for other new innovative frameworks that came after and now have the upper hand in some key points compared to Storm. However, Storm is still being considered a pioneer in this field and gaining support day by day by major players.

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Accounting for Circular Economy in Western Balkan Countries

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Abstract

Circular economy is a new term in Albania, but it is widely spread all over the world. It is one of the sustainable development goals of 2030.

According to the studies, humanity is using the equivalent of 1.75 times the earth's natural resources each year. The solution, a circular economy, will fundamentally reshape industries—and it's already underway. So, they recommend passing from a linear economy to a circular one.

Accountants propose that the businesses must change the way they think about the value, impact and risk in their business and then they will create a circular economy. They are thinking to create new standards or to improve the existing to present the real situation of businesses.

Western Balkan countries, where Albania is one of them, explore different methods to face these changes and are in the first phases to develop circular economies.

This is why we choose to examine the development of circular economy and its accounting in Western Balkan countries like: Kosovo, Serbia, Montenegro, Northern Macedonia and Bosnia and Hercegovina.

Finally, we will give a panorama of similarities and differences in their development, advantages and disadvantages etc.

Keywords: circular economy, accounting, standards, Western Balkan countries

Jel Code: M41, Q53, Q56

Introduction

As we know, during last years the world is shouting for a “clean world”. It means that we can save earth and low the temperatures if we contribute to lowering the quantity of pollution that comes from different sources such as: the emission of CO₂ in the environment from large companies, the increasing consumption from the people, the wide use of plastic etc.

Based on Circularity Gap Report 2020¹ 100 billion tons of materials enter in economy every year and only 8.6% of them are cycled back on it. So around 90% of them are lost. They affect the temperature of the planet, and they warm it about 1 grade in 2017 and 1.1 grade in 2020. If we continue with this rhythm, we will have a 3.2 grade warming temperature of the planet during this century and the consequences will be fatal. If we use circular economy, we can stop these warming temperatures.

In 2015, 196 countries signed the Paris Agreement. Worldwide climate action was set out: mitigation of climate change by limiting the average global temperature rise this century to well below 2-degrees; support for lower-income nations and transparent reporting of climate goals. But the reality says something else after 5 years. In 2018 the circularity was 9.1%, but in 2020 it has lowered as we see above. So, the nations during 2021 decided to assess the global economy through two lenses that are critical to circularity: emissions and materials. They have done a plan that will show its effects in the long-term period.

As we know the main goal of the companies all over the world is to maximize their profit. Most larger companies have set broad sustainability targets, but a few of them link this with circularity. For small companies this is a challenge, because they don't have constant profits.

In Western Balkan countries there are a lot of small companies, so the circularity is also a challenge for the future. Firstly, we need to pass from a linear economy to a circular economy. A linear economy means “take-make-waste”. Now we must pass in a circular economy that means “reduce-resource-use”. But this is very difficult, because we have to change the minds of the managers and learn them that “circular economy uses both linear economy definitions and sustainable concept”. So, we are in the first steps of implementing.

We choose to discuss accounting in circular economy in Western Balkan Countries, because these countries have many similarities in their implementation.

As we see from the literature there are no changes in accounting to explain the circular economy. In the future the experts will change the international standards and maybe they will invent other standards to reflect the changes that brings circular economy in the business.

Literature review

We live in a world with finite sources, so we have to use them to fulfill our needs as effective as it is possible. The most part of the things we consume is designed to be used once and then discarded. This leads to enormous tons of materials and then in pollution. As landfills increase their capacity

¹ Circularity Gap Report 2020

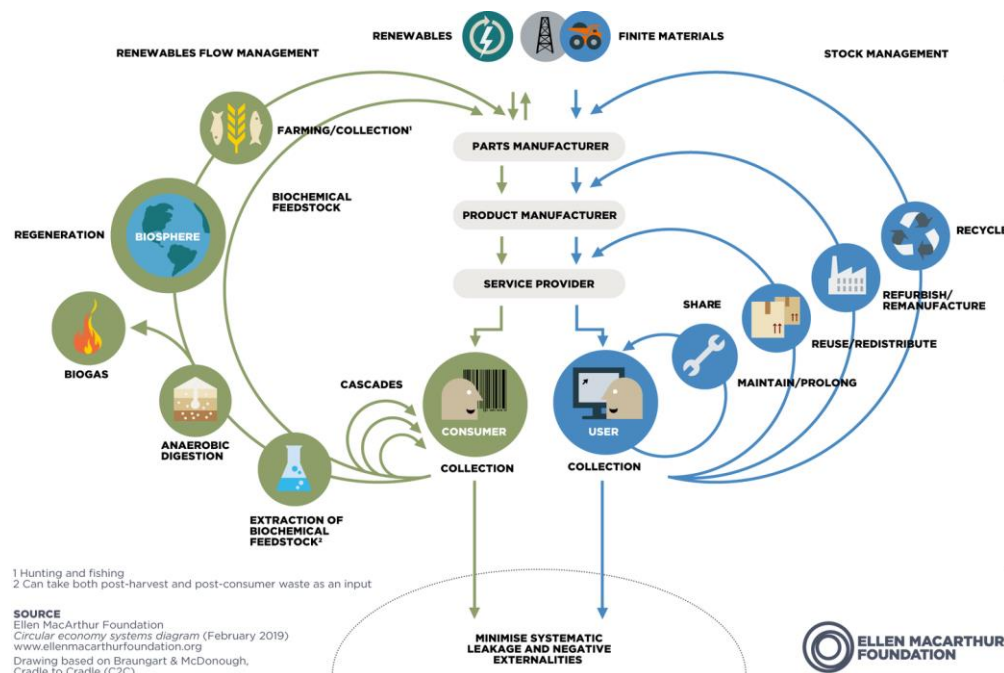
and plastics pollute the world, this last has to find the way to overpass it. Circular economy might be a solution for this problem. But what is it?

There are many definitions for circular economy from different authors.

The first that give a notion of a circular economy² was Walter Stachel in 1976. He was an architect and economist and proposed that concept in a report to the European Commission. He said that “the core concept of a circular economy is to eliminate waste by continually using the same resources. It employs tactics such as reuse, repair, remanufacturing, refurbishing, sharing, and recycling, to create a closed-loop system, that reduces the need for a constant supply of new materials. Thus, the circular economy helps to reduce waste, pollution, and lower carbon emissions.” In this way, it is different from the linear economy that we live in today which follows a ‘take-make-dispose’ model of production, and that our current accounting practices are set up for”.

The Ellen Macarthur Foundation has tried to capture the essence of a circular economy in a diagram known as the ‘Butterfly diagram’ (fig. 1). The diagram breaks down inputs into two main streams; the blue loops which represent technical materials, and the green loops which represent biological materials and helps to visually explain what a circular economy might look like.

Figure 1: Butterfly diagram



According to Ellen Mac Arthur Foundation the circular economy is based on three principles:

² <https://www.greenbusinessmba.com/blog/what-is-circular-economy-accounting>

Eliminate waste and pollution

Circulate products and materials

Regenerate nature

So, the circular economy is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution.

According to Gençer 2022, there are six best practices to circular economy:

Design an enabler corporate structure

Assess circularity of your business periodically

Improve industrial symbiosis

Design sustainable products

Nudge costumers

Use technology to improve circularity

According to Hestin and Poukka, from Deloitte, there are seven types of circular economy business models:

Cradle to cradle; A manufacturer designs waste free products that can be integrated in fully recyclable loops or biodegradable processes.

Take-back management, including reverse logistics; A manufacturer or retailer takes back the product using reverse logistics streams.

Deposit systems: A manufacturer or retailer (or groups of) takes back their own products (or a common product) and refunds the customer.

Repair: A manufacturer or retailer offers to repair their own products.

Refurbishment, including resale; A manufacturer or retailer offers to refurbish (clean and put in working condition) their own products.

Remanufacturing: A manufacturer remanufactures their own product and provides a guarantee for functionality / performance.

Rematerialisation, including recycling and cascading use; A manufacturer transforms or recycles a product into a new material or product.

According to Politico's ranking list, published in January 2022, some countries from European Union are doing well toward circular economy and some others are not at the same level. They based their ranking on seven of the European Commission's key metrics. The three on top of the list are Germany, United Kingdom and France, which have robust recycling systems and high levels of innovation in circular economy sectors. Then it comes Poland and Czech Republic, meanwhile green Nordic countries are at the end of the list. But this doesn't mean that countries

that are in the top of the chart are the greenest. This is partly because practices that reduce impact on health and the environment don't necessarily contribute to circularity.

As the world changes from a linear economy to a circular economy, what about the accounting?

As we know accounting is the process of registration of all monetary transactions that happen in a company. A key role to accounting for circular economy plays Coalition Circular Accounting (CCA). It is a group of experts and scientists from finance, accounting and law founded by The Royal Netherlands Institute of Chartered Accountants (NBA) and Circle Economy. The CCA uses real-life business cases to demonstrate the accounting challenges that circular business models face. They stress that accounting must be a driver to circular economy not an enabler of it. According to CCA “circular accounting describes the practice of measuring, analyzing and reporting on a company’s financial and non-financial performance, to truly reflect the value and impact of circular businesses on all relevant stakeholders”³. Circular accounting is about making the 'intangible' impacts of the circular economy tangible and measurable in order to disclose them. In its report (January 2022), CCA, emphasize that circular accounting is not well understood. About 96% of the companies in the major European stock market indices (such as FTSE, CAC, DAX) publish a sustainability report and far fewer, however, integrate sustainability and circularity information into their financial statements. CCA says that circular accounting could allow us to see the relationship between financial and circularity performance. This may encourage executives to integrate circular economy factors into their operational, strategic, and financial choices. As a consequence of this, CCA think that is a need for standardized and comprehensive circular accounting guidelines. CCA suggests that to pass in a circular economy, and after that in circular accounting, we need to redefine the value, impact and risk of the company. The accountants have to comprise non-financial information into financial reporting. This is a goal to be achieved during 2023 and must describe better the situation of the company. Circular accounting and reporting will put circularity on the minds of company executives and enable investors to demand better performance on circularity—and higher quality data to accurately quantify and credibly represent such performance. Executives will see circularity not just as a side issue, but as material to the company’s success.

According to En – Zhu Li and others (2018), the accounting professional education will be improved to adapt to the circular accounting. They suggest four innovative contents to be added to the accounting professional education: including complement of innovative disclosure form of accounting information, enrichment of concept of natural resource assets, improvement of innovative accounting methods and enlargement of innovative connotation of accounting cost.

According to Roelink (2019), accounting in circular economy is affected from rule setting in Dutch economy. She conducted a study based on the interviews on accounting professionals that encountered the circular economy in their work. She concluded that the absence of one clear norm for the circular economy hinders reporting and valuation, that risks associated with remaining

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linear are neglected and that these risks can have important implications for both valuation and reporting.

Larsen (2021) studied the value of used parts. She thinks that sustainability work is moving from the communications manager and over to the finance manager. She thinks that there are three core factors that ensure a real green shift. Firstly, there is a need for innovation in the business models. Secondly, these business models affect the accounts and financial management. Thirdly, they create a need for new financing solutions. She said that it is needed a new international financial reporting standard to help companies to value used parts and to pass then the effect in the financial statements. She based her study on car market, as an example of circular economy.

According to the Collings (2022), circular economy accounting⁴ is the principles, reporting, and accounting framework that need to be developed to support a new wave of circular economy businesses.

Circular economy in Western Balkan Countries and their accounting

Western Balkan Countries include Albania, Northern Macedonia, Kosovo, Bosnia and Hercegovina, Serbia, and Montenegro. One of the main strategic objectives of European Union is to welcome these countries as soon as possible. European Council opened accession negotiations with Albania and Northern Macedonia in March 2020. Serbia and Montenegro are in accession talks with European Council and Kosovo and Bosnia and Herzegovina are potential candidates for European Union. All these countries have Stabilization and Association agreements with European Union, opening up trade and aligning the region with European Union standards. All are in the first steps of circular economy and the studies in this field are very rare. They don't apply any special standard of accounting for circular economy.

Albania.

According to Biracaj and others (2014), the accounting practices and regulations do not have the proper structure on reporting the environment issues. They studied three companies with negative impact on the environment and concluded that in Albania neither positive nor negative impacts in environment are not reported in financial statements.

According to Blau and Janssen (2020), in Albania have been developed several strategic and regulatory frameworks to address the stimulation of green businesses. But there is a gap between the regulation and their application. There is a low number of environmental inspectors and often the companies don't respect the legislation and don't have a permission to operate. There are several businesses using circular economy principles, but they don't know this. They list some start up and projects that are operating in circular economy field such as: Innovation Hub Tirana, Yunus Sustainable Business Balkans, TechSpace, Protic, InnoSpace etc. The financing sources to

⁴ <https://www.greenbusinessmba.com/blog/what-is-circular-economy-accounting>

develop circular economy are in a low level in Albania, so many people don't know the meaning of it.

According to the Regional Circular Economy Country Specific Report (2020), the concept of circular economy (CE) is still at an early stage in Albania⁵. The most part of it, is about waste management. There is progress in the numbers of businesses that implement circular economy in their businesses, but it is only in first phases, waste management and waste to resource phases. The central government and local government have many things to do for circular economy not only waste management, but to impose strict regulations on them. Based on the latest waste management plan, the government is lacking the will to reduce the amount of waste by respecting the waste hierarchy steps, for most of the budget is poured into building incinerators and landfills. Ensuring a successful transition to circular economy, however, requires efforts on many different fronts; circular economy goes beyond waste management. To implement circular economy there are a number of processes that all stakeholders are involved, including the key player that is government. Then in the report are listed some recommendations for central government and local government such as:

The closure of illegal and poor landfills that do not fulfill the minimum requirements for environmental protection.

Provision of economic incentives for producers who bring green products to the market and which support recycling and recovery schemes (e.g., packaging, batteries, electrical and electronic equipment, vehicles) and stimulate 'Green make' innovations on goods and services.

Developing sustainable policies towards waste treatment while respecting waste hierarchy.

Reducing the investments on building new landfills and incinerators, which are to be considered as the last choice after all waste treatment methods have been exploited.

Drafting regional and local plans in favor of waste integrated management.

Institutional coordination over the management of urban/hazardous wastes.

Raising economic investments and law enforcement towards a more environmentally friendly waste production and management.

As a major consumer, public authorities must adapt to the Green Public Procurement (GPP) approach as much as possible, by choosing to purchase goods and services which are environmentally friendly throughout their lifecycle.

Guarantee participation in Horizon 2020 and prioritize investment seeking to boost innovation and competitiveness.

There is no integrated approach to the country. It is therefore recommended that Albania has to transpose and implement EU directives related to the current economy.

⁵ Co-PLAN, Institute for Habitat Development, Regional Circular Economy Country Specific Report, 2020.

Launching education programs, mainly at preliminary school level, to involve the citizens in the waste management operations and the achievement of circular economy.

According to Maleš (2020) Albania sets up the goals of circular economy with the change of legislation on waste management and sustainable energy. These changes will be made from the private sector, but the development is very slow. According to the statistics generated from INSTAT 78% of the waste deposited in the landfills, 2.4% of waste illegally dumped in uncontrolled areas and 0.9% of waste incinerated. The main obstacles to the development of circular economy came from lack of support from general and local government.

According to Albania Country Economic Memorandum (2021), Albania has done progress toward sustainable economic growth, but the situation is fragile. The earthquake of 2019 and Covid-19 disease has stopped the economic growth and the implementing of green economy.

According to Balkan Forum (2021), recycling rates in Albania are very low. In 2019 the recycling waste rate is about 18% (meanwhile the average in Europe is 44%). There are many incinerators in Albania that do not fulfill the main regulations of operating and many others are in process. They will have many serious consequences for public health and environment in the future. According to this study there are about 9046 illegal landfill dumpsites and only 6% of them are cleaned. The government of Albania and Vlora municipality are planning the construction of a new landfill, near the city, which will be in accordance with European Union acquis. This will increase the waste recycling rate.

In Albania the companies use national and international accounting standards to prepare their financial statements. There are no specific accounting standards to reflect the effects of circular economy in the financial statements.

North Macedonia.

According to Shikaleska et al., circular economy in North Macedonia is mainly business focused and business driven in 2017. The main barriers to circular economy are financial resources and lack of legislation framework. The main factor that influence the success of implementation is raising costumer awareness of circular economy.

According to Eionet Report (2019), North Macedonia has done progress towards circular economy. It has approved the law of Waste Management and the key component is waste management hierarchy that begins with minimizing the adverse environmental effects of waste and then increasing resource efficiency in waste management and policy. Then in the report are listed best practices in circular economy as: the delegation of the authority of central government to local government to prepare energy-efficiency programs and to report them to Energy Agency periodically, improvements in transport sector, improvements in value added tax law for thermal solar panel systems and components, specific sub-laws regulate the energy efficiency of specific products and construction facilities, specific sub-law is in force relating to ecolabels for tourist facilities, defining limits on energy and water consumption, as well as regulating waste generation in tourist facilities, mainly through the proper classification, selection and transport of waste,

support is extended for the use of renewable sources of energy and the promotion of environmental education etc.

According to the Mavropoulos and others (2020) it is a strong relationship between climate change, circular economy and waste management. For North Macedonia that has a low rate of industrialization and import of manufactured materials are the main way to acquire them, waste management is a starting point to shift to circular economy. By shifting the management of specific waste streams to circular practices, not only substantial environmental and economic benefits are achieved but the waste management sector can act as a catalyst for the whole economy of the country. The authors assessed the economic, employment and emission benefits from circular practices in the following waste streams:

End of Life Vehicles (ELVs)

Biowaste

Construction & Demolition Waste

Electrical and electronic equipment (WEEE)

Plastics

Secondary Residual Fuels (SRF)

According to the report of “Competitiveness in Southeast Europe 2021” Northern Macedonia has made progress in several policy areas, such as climate change, biodiversity, and forestry. Now it should involve all stakeholders in making the implementation of a circular economy a reality. North Macedonia has made some progress in developing the legislative and policy framework for a circular economy. Effective implementation will require a whole-of-government approach with collaboration by the relevant ministries to steer the transition to a circular economy. The government should also establish a platform for wider co-operation among businesses, financial institutions, and other stakeholders. North Macedonia should also consider encouraging best practice exchanges between municipalities by helping local government associations or environmental NGOs to develop guidelines, training, and initiatives to recognize best practice.

According to the Regional Circular Economy Country Specific Report (2020), the development of the sectors that are fundamental for circular economy are still relevant in Northern Macedonia. The role of awareness raising education, training, and capacity building on the concept of circular economy in Northern Macedonia are improved during the last years. In report are some recommendations that Northern Macedonia has to accomplish during the incoming years like:

In order to comply with the Circular Economy Package, North Macedonia will need to monitor the introduction of production processes and standards in order to minimize source waste and improve the recycling rate of used products.

Successful compliance with the new regulations will require improved cooperation activities and shared responsibilities among all stakeholders.

Traditional inspection methods will need to be supplemented with new enforcement mechanisms based on preventive measures.

There is an urgent need for improved protocols and an integrated system for data collection and reporting on waste management.

According to Maleš (2020) North Macedonia will need to minimize source waste and improve the recycling rate of used products to apply Circular Economy Package. The recycling rate is very low. The government incentives to improve recycling are limited. The performance of process of transition in circular economy is difficult to measure because of the lack of the accurate information and data.

According to Balkan Forum (2021) recycling rates in North Macedonia are very low, about 0.7% in 2020. This figure is increased during the years, but it is a lack of information about it. North Macedonia has about 1000 municipal dumps, located in rural areas and 43 active landfills.

In North Macedonia the companies use international accounting standards for small and medium enterprises and international accounting and financial reporting standards to prepare their financial statements. They don't use special accounting standards to reflect the effects of circular economy in the financial statements.

Kosovo

Beqaj and Rizvanolli (2018) studied the implication of Circular Economy approach to the future urban development of Pristina city. They concluded that certain institutional and business term innovative modifications are required in Kosovo construction industry in order to enhance adoption of global trends of Circular Economy.

According to Balkan Green Foundation and Institute for development Policy Report (2018) the number of them who recognize circular economy (about 60%) is higher than of them that didn't recognize it. The part that recognizes circular economy define it as something that they reuse or recycle.

Hapçiu (2019) studied perceptions, knowledge and behaviors of Kosovo citizens about circular economy. She conducted a survey to Kosovo citizens and concluded that more than 60% of population doesn't know what is it circular economy. So she recommend financial initiatives and penalties in order to spread as soon as possible the term and the practice of circular economy.

According to the Regional Circular Economy Country Specific Report (2020), circular economy is not yet included in the legislation of Kosovo, so its implementation is difficult. The environmental sector in general, and the field of waste management in particular, water, air, etc. are areas where information is scarce. The origins of circular economy can find in the initiatives of companies in the private sector, in superficial discussions by nongovernmental organizations, and rarely in national or local policies and legislation. Citizens of Kosovo currently consider circular economy as a good idea but without economic interest, while waste as an expense and not a profitable opportunity. Then the report conclude in some recommendations about the implementation of circular economy in Kosovo such as:

Complete the legal framework by including the methods of application of circular economy in Kosovo, providing facilities for persons, entities (for-profit and non-profit) that are contributing or plan to contribute to the stimulation of circular economy in the country.

Financial incentives in the form of subsidies or direct payments to the population can bring a change in mentality and behavior and lead to concrete results that can push the development of circular economy forward.

Fiscal and non-fiscal incentives, which could provide guarantees for certain investments, which could stimulate circular economy and help encourage businesses to take investment actions that increase the efficiency of the production, consumption chain and could also contribute to a faster transition to this economic model.

Other facilities to do business with circular approach can return the focus of short-term economic development.

Provide business with easier access to innovative technologies by supporting the facilitation of doing business with more developed countries.

Greater cooperation between neighboring countries to exchange experiences, practices in promoting regional economy in the country and the region.

Circular economy should be included in school curricula, in all cycles of education.

According to Maleš (2020) Kosovo has many problems with illegal landfills, but has some very good examples of circular economy, which could serve as inspiration for other regions of the country. There are about 23 private companies which deal with managing the recycling waste. The term of circular economy is not included in Kosovo laws, and this is the main obstacle of its development.

According to Balkan Forum (2021) recycling waste rate in Kosovo is very low, but it increased when Municipal Solid Waste recommend the separation of household, recycling and institutional management from each other. In 2020 it was about 5%. In Kosovo operate 4 landfills under the Kosovo Landfill Management Company and one transfer station in Ferizaj. These landfills operate according to all regulations and environmental requirements. But there are also many illegal dumpsites that overpass them legal, about 2529 in 2019.

In Kosovo small and medium enterprises use national accounting standards to prepare financial statements, meanwhile other enterprises use international accounting and financial reporting standards. They don't use specific standards to reflect the effects of circular economy in their financial statements.

Bosnia and Herzegovina

According to Circular Economy Report (2020) circular economy has been introduced in the recent years in Bosnia and Herzegovina, while starting or implementing work and services. It is recognized as a model that supports sustainable development. Circular economy isn't included in

existing environmental law, policies and regulations, however the law on Waste Management existed since 2009 there. The most part of population of Bosnia and Herzegovina confuses circular economy with recycling. But during recent years circular economy is becoming more recognized as a term and as a practice to be used. There are many best practices examples in supporting circular economy principles in Bosnia and Herzegovina. Statistical data about the economy of Bosnia and Herzegovina are published in EUROSTAT but are delayed.

According to Maleš (2020) Bosnia and Herzegovina is dealing the most with illegal waste management and illegal landfills all around the country. The recycling rate of the country is very low, about 0.29%. There are few activities on waste reduction. Waste on legal landfills are 75.6% and on illegal dumpsites are 23.9% according to the statistics of Agency for Statistics.

According to Balkan Forum (2021) recycling waste rate in Bosnia and Herzegovina is very low, about 0.29%. But estimates suggests that around 10% of waste is recycled there, but this is unofficial. There is not a waste market in the country. There are only two regional waste disposal sites partly implementing circular economy Smiljevići and Ramići.

In Bosnia and Herzegovina companies use international accounting standards for small and medium enterprises and international accounting and financial reporting standards to prepare financial statements. They don't use specific standards to reflect the effects of circular economy in their financial statements.

Serbia

According to Spotlight Report on Circular Economy in Serbia (2018) the concept of circular economy is heard from 2002 in conferences and workshops. Transition to circular economy will help Serbia to achieve its international commitments. Serbia is implementing some initiatives that support the circular economy, but this last is still in its early stage, because Serbia connects circular economy with waste management. The report concluded with some recommendations such as:

Serbia should straighten legal and policy frameworks for a circular economy.

Environmental policy framework needs to be reinforced in key economic and sectoral policies.

It is need to mainstream sustainability in risk management and foster long-term.

It is necessary to accelerate the awareness raising and dissemination of knowledge on circular economy topics.

Meanwhile the Spotlight Report on Circular Economy in Serbia (2020) indicates that circular economy is still in its early stage, although Serbia has been having Waste Management Strategies since 2003, in line with EU acquis, now in 2020 the latest strategy is not legally valid. European Union changed the regulations on circular economy, meanwhile Serbia hasn't done the same. The report concluded with some recommendations such as:

The use of natural resources and circular economy concept are not a national priority and strategic goal

No integrated approach is in place limited multi-sectoral approach and connection.

Appropriate and adequate waste management policy related to circular economy.

Means of financing by all sources.

Capacities, primarily at local level and businesses.

Limited awareness raising and education/dissemination of knowledge around circular economy topics and green agenda, including youth.

Stricter enforcement of the environmental policy framework in key economic and sectoral policies.

According to Circular Economy Report (2020) circular economy in Serbia is still in its early stage, but it is implementing some initiatives that support circular economy. The recommendations are as above.

According to Maleš (2020) there is a growing interest in circular economy in Serbia. Media focuses on waste management as circular economy symbol. The recycling rate is very low. The main obstacles for circular economy are: the lack of circular economy in strategic goals of the government, means of financing by all sources, educating the youth with circular economy topics etc.

According to Balkan Forum (2021) the municipal waste recycling rate was 3%, meanwhile the recycling rate for packaging waste was 35 to 40% during 2018. In Serbia there are 9 regional sanitary landfills and 2 municipal landfills which operate according to European standards. Here we can mention that there are no facilities for the treatment of organic municipal waste, supposing that 50% of municipal waste is organic.

In Serbia companies use international accounting standards for small and medium enterprises and international accounting and financial reporting standards to prepare financial statements. They don't use specific standards to reflect the effects of circular economy in their financial statements.

Montenegro

According to Regional Forum on Sustainable Development UNECE Region (2018) Montenegro was among the first countries in the region of South-East Europe that defined the strategic and institutional framework for sustainable development. This because of the development of the agricultural sector.

According to Circular Economy Country Specific Report (2020) the concept of circular economy is quite new in Montenegro, and it is often confused with green economy. Statistic data for municipal waste and industrial waste are not reliable. The most important point related to the transition from a linear economy to a circular one is establishing communal infrastructure for waste disposal. Some circular economy initiatives are bike-sharing, reduction of communal waste and raising awareness of recycling, Smart City – Podgorica, etc. Montenegro is having trouble with the implementation of local management plans and unreliable data on communal waste during the implementation of waste management. There are many barriers to the use of technical materials in the context of introducing circular economy. There is lack of investments into renewal and

maintenance of the existing infrastructure, into innovations and technologies as well of insufficient waste separation and recycling.

According to Circular Economy Report (2020) in Montenegro the term circular economy is identified with green economy. Montenegro has not yet made the transfer from linear economy to circular economy. In Montenegro the stage of circular economy is linked with the stage of the following aspects:

- (a) production and consumption,
- (b) waste management,
- (c) secondary raw materials and
- (d) competitiveness and innovation.

According to the stage of the above indicators we could say that circular economy is in the first steps in Montenegro.

According to Maleš (2020) the key actions to circular economy in Montenegro are switching to: natural materials, Ecco-innovation, and education. The data on municipal waste in Montenegro are unreliable and inconsistent. Montenegro has 19 municipalities and only 5 of them state the share of a separate recycling fraction. The main obstacles for the transition to circular economy are the lack of legal bases, key documents, financial resources, and infrastructure.

According to Balkan Forum (2021) in Montenegro the recycling rate is about 10%. There are 273 unregulated landfills and approximately 60% of the total waste collected in the country ends up in these sites.

In Montenegro, companies use international accounting standards for small and medium enterprises and international accounting and financial reporting standards to prepare financial statements. They don't use specific standards to reflect the effects of circular economy in their financial statements.

Conclusions and recommendations

For small countries like Albania circular economy is a challenge. We have to pass from linear economy, “take – make – waste” to circular one, “reduce – resource – reuse”. So, we have to change our way we live and do business. In other words, we have to change our minds.

Accounting for circular economy is a new concept and needs improvement and changes in national and international accounting standards.

In Western Balkan Countries, the development of the circular economy is almost in the early stages. Most of the countries designed the way and the regulations framework to pass from linear economy to circular one.

All Western Balkan Countries are in the stage of waste management and have done many investments for this.

In the Western Balkan Countries, the accounting for circular economy is the same with the accounting for linear economy.

Accounting for circular economy isn't the same with that of linear economy. We have to report the effects of circular economy in financial statements and the accountants are working for new standards of financial reporting.

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“The impact and coping challenges of circular economy in the use of green products in Albania”

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Abstract

In recent years, the world is facing major challenges of climate change and air pollution. To better face these challenges, the use of the circular economy (CE) is becoming necessary. According to EUROSTAT, a circular economy aims to maintain the value of products, materials, and resources for as long as possible by returning them to the product cycle at the end of their use, while minimizing the generation of waste. The fewer products we discard, the few materials we extract, and the better for our environment. This study aims to identify the impact of the circular economy on the use of green products, as well as to determine the main factors that are facing these global challenges in Albania. The quantitative and qualitative analysis was conducted, through a face-to-face survey with the scientific master's students of the Agricultural University of Tirana. Descriptive analysis and a multifactorial regression model are used. From the answers of the interviewees, they stated that the main factor that affects the purchase of green products is the approximation with the use of the circulating green economy in Albania. The main challenge for these products is to revise the Albanian legislation for the labeling of these products. Also, this study will present the current situation of the Albanian economy, as well as the political supports that aim to modernize the economy from linear to circular, making it more sustainable, green, and competitive.

Keywords: The circular economy, Green products, impact and challenges of the circular economy, sustainability, multifactorial regression.

Introduction

The circular economy is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution (Foundation). The transition from a linear economy based on the 'take-make-dispose' approach toward a circular economy allows for a more ecological use of natural resources, low carbon emission, energy saving, and environmental protection, considering that natural resources are depleting at a fast pace with the world population increasing rapidly (IOM, 2019). Regarding the situation in Albania, the concept of a circular economy is still at an early stage. Nowadays, research and information on the circular economy will help to go from a linear to a circular economy. Due to the increase of environmentalism which has dominated the world, has been a raise in consumer concern with regard to environmental protection and great demand for green products (Yan, 2014). If the consumer was to purchase a green product then the purchase decision here is made not only on the green product itself, which provides the primary core benefit to the consumer but also the other social benefits that the consumer perceives it would have such as being environmentally safe (D` Souza, 2006). Green marketing consists of a wide range of business activities that intends to satisfy customers' needs and wants, as well as decreased negative impacts on the natural environment (Tiwari, 2011). Green products can help firms and economies move swiftly toward a sustainable environment. A company and consumers when they use green marketing in the modification of business and implement green product development can reduce production costs in the long term. Environmental challenges and the reduction of natural resources have led to an increase in sustainable development. There is a need to tackle sustainability, which can be achieved by integrating national and international policies regarding the circular economy (CE), the green economy (GE), and the bio-economy (BE) (Gura1, 2021). The business has a chance to behave in an environmentally responsible manner and use the financial resources to establish the firm's innovative environmental products and technologies to aciform profitability and ensure environmental sustainability (Yan, 2014). For firms to uphold their sustainable competitive gains in today's dynamic market and surrounded by ever-swelling environmental pressures, espousing green innovation approaches can lead to offering valuable, inimitable, and unique resources to outweigh rivals, especially in terms of performance (Xue, 2019). According (Yim & Fung) describe green innovation as a transformation process that comprises novel ways of doing things (e.g., production–manufacturing, construction, procedures, systems, etc.) that provide direct and positive benefits to the environment. According to (Chen & Lai, 2006), green innovation is a novelty used in technologies that incorporate energy saving, pollution prevention, waste recycling, green product designs, and corporate environmental management. Green products have gained increasing attention in recent years because consumer environmental consciousness is a driven factor that facility driving green product development (Schlegelmilch, Bohlen, & Diamantopoulos, 1996). Circular economy underlies the green economy's umbrella, which is joined by the common ideal to reconcile economic, environmental, and social goals that increase the sustainability of the environmental (Gura1, 2021). The struggle to maintain environmental sustainability is a challenge, and this challenge is met by substituting and using green products. Most consumers use them even though they do not have enough information about why they serve today in the environment. The transition from a linear to a circular economy (implementation in a green economy) has become a necessity. This study is

focused on raising the awareness of young consumers on the use of green products as well as the advantages they bring to the environment.

Literature Review on Circular Economy

From a Linear to a Circular Economy

It conceptualizes a new economic system of change in business model innovation on one hand, and consumer behavior on the other, in which, both producers and consumers focus on reprocessing, renovating, and recycling previously used materials and products (Hysa, 2020). According to (IPPM) the revised Strategy of Integrated Management of Waste is developed on the vision or perception of the concept of "zero waste", so that waste is collected and treated as raw materials, and management is done following the concept of circulating systems, serving the criteria of using and preserving raw material resources. The circular economy has become a dominant factor in economic development, increasing well-being or creating new jobs by reducing greenhouse gas emissions, waste, and pollution.

From Circularity to Sustainability

The circular economy is part of the 2030 Green Agenda, a strategic decision by the European Commission. Sustainable development is a development that meets the needs of the present without compromising the ability of future generations (Kruja, 2013). Circular Economy is based on three dimensions, economic, social, and environmental. The cooperation of these dimensions makes the environment more sustainable. It also results in healthier generations. Empowering consumers and providing them with cost-saving opportunities is a key building block of a sustainable environment (Commission).

Green products and green innovation

Green Innovation refers to all forms of innovation that minimize environmental damage and ensures that natural resources are used in the most effective way possible. According to (Takalo, 2021) environmental degradation has turned into a major threat to human survival. A successful Green Innovation improves the market position attracts customers, provides green services, and gains a competitive advantage (Takalo, 2021). Consumers' green awareness is a key market-driven factor that promotes the sustainable supply chain, and their demand for green products has elicited extensive attention in the world (GuoLi, 2021).

Materials and Methods

The purpose of the study is to highlight the impact that the new generation today have on the circular economy and how they can face the challenges of buying and consuming green products. A questionnaire with 200 samples was designed face-to-face with science master's students in all faculties of the Agricultural University of Tirana. This university has various faculties such as: Faculty of Economics and Agribusiness, Faculty of Biotechnology, Faculty of Agriculture, Faculty of Forestry, and Veterinary Medicine. Quantitative and qualitative data were processed with the SPSS statistical program. In this study, descriptive analysis with tables and graphs as well as the multifactorial regression model are included. The answers to the interviewers are random and real. The questionnaire includes socio-demographic variables, also specific questions about the circular economy and green products. This literature will serve new generations as valuable information transitions from a linear to a circular economy, where the main priority is saving the sustainability of the environment.

The results show that new generation are ready to pay more for green products in order to save the sustainability of the environment. The less waste, the more sustainability and, above all, the health and well-being of the consumer.

Analysis Descriptive

Table 1 Gender of the interviews

Description	Frequency	Percent	Valid Percent	Cumulative Percent
Female	104	52.0	52.0	52.0
Valid Male	96	48.0	48.0	100.0
Total	200	100.0	100.0	

The table above shows the gender of interviews. 52% are female and 48% are male.

Table 2. Age of the interview

Description	Frequency	Percent	Valid Percent	Cumulative Percent
18-25	160	80.0	80.0	80.0
Valid 25-35	28	14.0	14.0	94.0
Over 35	12	6.0	6.0	100.0
Total	200	100.0	100.0	

Table 2 shows the age of interviews. According to this data 80% are 18-25 years old, 14% 25-35 years old and 12 % are over 35 years old. The age are new generation because the survey is conduct with master students of Agricultural University of Tirana.

Table 3. Living place

Description	Frequency	Percent	Valid Percent	Cumulative Percent
Urban	160	80.0	80.0	80.0
Valid Rural	40	20.0	20.0	100.0
Total	200	100.0	100.0	

Table 3 shows the living place of interviews. The most of them lives in urban area (80%) and only 20% lives in rural area.

Table 4. The level of education

Description	Frequency	Percent	Valid Percent	Cumulative Percent
University	176	88.0	88.0	88.0
Valid Post university	12	6.0	6.0	94.0
Graduate	12	6.0	6.0	100.0
Total	200	100.0	100.0	

Table 4 shows the level of education of interviews. Seem very clearly the interviews are with university diplomas (88%), 6% are with post-university and 6% again are graduate.

Table 5. Monthly income

Description	Frequency	Percent	Valid Percent	Cumulative Percent
350-450 €	48	24.0	24.0	24.0
450-550 €	28	14.0	14.0	38.0
Valid 550-650€	28	14.0	14.0	52.0
650-750€	16	8.0	8.0	60.0
Over 750€	80	40.0	40.0	100.0
Total	200	100.0	100.0	

The table above shows the monthly income of the students interviewed. Nowadays, young people have more opportunities to work as part-time, also online. This can be seen clearly in their monthly income.

Table 6. Do you think that the transition from a linear to a circular economy is beneficial for the environment today?

Description	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	124	62.0	62.0	62.0
No	12	6.0	6.0	68.0
Maybe	64	32.0	32.0	100.0
Total	200	100.0	100.0	

Table 6 shows the data of the transition from linear to a circular economy. 62% agree with this phenomenon, 6% no and 32% are not sure about this change.

Table 7. Have you heard of green products before?

Description	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	180	90.0	90.0	90.0
No	20	10.0	10.0	100.0
Total	200	100.0	100.0	

Table 7 shows that 90 % have had information about green products, but 10% are not informed about them.

Table 8. Do you think that the use of green products affects the conservation of exhaustible resources?

Description	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	132	66.0	66.0	66.0
No	20	10.0	10.0	76.0
Others	48	24.0	24.0	100.0
Total	200	100.0	100.0	

Table 8 shows, 66% of interviews think that green products are necessary for environmental sustainability.

Table 9. Do you buy green products in your family?

Description	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	156	78.0	78.0	78.0
No	12	6.0	6.0	84.0
Valid Others	32	16.0	16.0	100.0
Total	200	100.0	100.0	

78% buy green products, 6% didn't buy and 16% are confused for this new concept of production.

Table 10. How ready are you to pay more for green products?

Description	Frequency	Percent	Valid Percent	Cumulative Percent
5%	56	28.0	28.0	28.0
10%	80	40.0	40.0	68.0
Valid 15%	56	28.0	28.0	96.0
20%	8	4.0	4.0	100.0
Total	200	100.0	100.0	

According to the percentage, the interviewers are ready to pay more for green products.

Table 11. If the logic of the circular economy is so compelling, why aren't more companies doing it already?

Description	Frequency	Percent	Valid Percent	Cumulative Percent
It has high costs	64	32.0	32.0	32.0
Information missing	60	30.0	30.0	62.0
Valid Pressure of time	16	8.0	8.0	70.0
Lack of interest	60	30.0	30.0	100.0
Total	200	100.0	100.0	

The most important indicators are the high cost, missing information and no high interest.

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	11.888	4	2.972	4.429	.002 ^b
Residual	130.832	195	.671		
Total	142.720	199			

a. Dependent Variable: How ready are you to pay more for GP?

b. Predictors: (Constant), Monthly Income, Age, Gender, Level of education

Logic Model:

$$D \text{ (Willingness to pay)} = f(\text{Gen, Age, Place, Educ, Income}) + e$$

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.038	.381		2.727	.007
Gender	.104	.124	.061	.835	.405
Age	.258	.125	.171	2.059	.041
Level of education	.094	.135	.057	.693	.489
Monthly Income	.081	.038	.158	2.135	.034

Chi-Square Tests

Description	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	16.498 ^a	2	.000
Likelihood Ratio	15.690	2	.000
Linear-by-Linear Association	11.746	1	.001
N of Valid Cases	200		

Discussion and Conclusions

Data processing shows that we have 52% are female and 48% are male.

According to the data above 80% are 18-25 years old, 14% 25-35 years old and 12 % are over 35 years old. The age is new generation because the survey is conducted with master students of the Agricultural University of Tirana. Most of them live in an urban area (80%) and only 20% live in a rural area.

Nowadays, young people have more opportunities to work part-time, also online. This can be seen clearly in their monthly income.

Seem very clear the interviews are with university diplomas (88%), 6% are with post-university and 6% again are graduates.

The transition from linear to a circular economy shows that 62% agree with this phenomenon, 6% no and 32% are not sure about this change.

66% of interviewees think that green products are necessary for environmental sustainability.

78% buy green products, 6% didn't buy and 16% are confused about this new concept of production.

The most important indicators are the high cost, missing information, and no high interest

The results show that for (sign. < 0.05) new generation is more willing to pay more for green products.

Age and income have a positive correlation with consumers' willingness to pay more.

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Alternative Performance Measures as a reporting feature of companies in the Green Accounting Era – a survey with big listed EU entities.

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Abstract

This paper deploys a simple comparative analysis that studies the alternative performance measures that are disclosed and reported in financial statements of fourteen big listed companies in the European Union. The sample is purposefully selected to represent at least two major entities from each of the six important economic sectors in the EU (the pharmaceutical, telecommunication & IT, beverages, food, apparel & fashion and industrial entities). We analyze their annual and integrated reports for 2021, 2020 and 2019 (for some of the entities), mainly the Management Discussion & Analysis, the Financial Highlights, the explanatory notes and other, wherever an APM may be disclosed and reported. The objective is to find any APM disclosed and reported, the label used for them, the level of disclosure as to comparativeness and reconciliation with other items in the financial statements, the definitions and other explanations included. We find that all of the entities are disclosing APMs to some extent and that they are consistent at doing so. The level of comparativeness, consistency and reconciliation is also high. We find differences among various sectors, with companies from food and fashion & apparel sectors disclosing less APMs and being focused more on sustainability and climate related reporting instead (such as carbon emissions, employee diversity and customer satisfaction rates). This study contributes in the field of improving research on APMs and more generally speaking on non-financial reporting in European and IFRS domain countries.

Keywords: Corporate Sustainability Reporting Directive; Alternative performance measures, Non IFRS reporting

JEL Code: M41

Introduction

Recently, the use of the alternative performance measures (APMs) is increasing in financial and integrated reports prepared by big and medium sized entities. The variety of their use, the variety of disclosure format and layout presentation as well as the lack of consistency and comparability has been a matter of concern for long. Various measures have been taken by the regulators to tackle this issue while the usefulness of using and reporting APMs is still vague and debated over, especially in the dawn of Green Accounting and Green Finance Era.

During the recent years we have witnessed the abundance of beyond-IFRS information, starting with the Alternative Performance Measures and continuing with non-financial (sustainability and integrated) reporting. Alternative performance measures (APMs) may supplement GAAP and IFRS reporting, and often represent an effective way of communicating other relevant and crucial information to understand the entity's performance. However, APMs are still a largely unregulated domain and as entities continue to use the existing measures and present new ones, regulators on the other hand are competing to present rules on their disclosure, calculation and use. One of the most prominent developments in this area is the issue of Guidelines on APMs by the European Stock Market Authority in 2015. This guideline intended to introduce some general guidance for entities that were already vastly and extensively engaged in disclosing APMs. Apart from the entities and the regulators, the researcher have already started to study whether and how the APMs are being used as a disclosure tools especially in the era of ever increasing importance of non-financial information.

APMs are disclosed in a voluntarily basis and generally are unaudited performance measures. Typically, they modify earnings, financial leverage, cash flow, or some other measures calculated in accordance with generally accepted accounting principles (GAAP) by (subjectively) adjusting, or omitting certain components. The rationale behind these adjustments is that in their perspective (management's perspective), these items are included in the first place to comply with IFRS, but they do not actually represent the economic true situation of the entity. As APMs mostly reflect the managerial position, we expect, and actually find, a large variety in the way that APMs are selected to be included in the financial statements, how they are calculated, how they are named, and even where they have been included in the annual report. As several studies carried out by auditing companies (Mazars Report & EY Report) report, there are some specific areas where APMs tend to drift apart and where the regulators have tried to intervene and present some order in all the variety.

Neutrality refers to the requirement by the regulators⁶ that the APMs must not be biased, i.e., used to avoid presenting adverse information to the market. In other words, APMs should be neutral. This neutrality perspective is important to be adopted by preparers of financial statements, in order to provide faithful and reliable information.

⁶ Regulators in this study mainly refer to authorities such as IOSCO and ESMA.

Prominence refers to the requirement not to present APMs with more prominence, emphasis or authority than the most directly comparable measure calculated and presented in accordance with GAAP. Also, the APMs should not, in any way, confuse or obscure the presentation of the GAAP/IFRS measures and they should not distract from measures directly stemming from financial statements.

Comparatives and consistency require that APMs be provided for comparative periods and presented consistently over time. In case an entity determines it will no longer present a particular APM, the reason should be explained. Also, if an entity decides to change an APM, it should explain the nature and the reason for making this change, including why the revised APM is more relevant.

Labels is related to the requirement to present and label the APMs in such a way that they are distinguished from GAAP measures. These labels should be meaningful and should reflect the composition of the APM. The label used should specifically not be similar or possible to confuse with labels used by IFRS.

Definitions of the APMs should be clearly provided and also a clear explanation of the basis of calculation. Also, a definition of components of APM including details of any material hypothesis or assumptions used in the calculation of APMs is required to be provided. ESMA also requires definitions to be disclosed for all APMs used in a clear and readable way. The ESMA guidelines also set out that the definition should indicate whether the APM relates to past or future reporting periods.

Reconciliations. The IOSCO guidelines require entities to provide a clear and concise quantitative reconciliation from the APM to the most directly comparable GAAP measure presented in the financial statements explaining the adjustments. When a reconciling item cannot be extracted directly from the financial statements, the reconciliation should show how the figure is calculated.

Explanations as to why a certain APM is included should also be provided. Entities should explain why they believe that an APM provides useful information regarding the financial position, cash flows or financial performance as well as the purposes for which the specific APM is used.

Location in the financial statements is also a crucial issue because it sometimes impacts the ability of investors to properly judge on the performance of the company. The guidelines generally require APM-related disclosures to be provided in the same document as the APMs themselves. The ESMA guidelines specify that such references should direct users to the information, suggesting the use of hyperlinks to the relevant documents or precise reference identifying the relevant page, section or chapter of the documents.

The purpose of this study is to analyse the extent and quality of use of APMs by several large companies in the European Union by focusing on the above crucial topics. The rest of the paper is organized as follows. In the next section we present a brief literature review by focusing on the fact that the majority of studies are not done in EU or IFRS domains. The third section explains the methodology and dataset. The fourth section presents the main findings on how some of the

biggest companies in EU are currently disclosing their APMs. In the last section we conclude by offering several recommendations.

Literature Review.

As Herr, Lorson & Pilhofer, who in their extensive study of 2022 have presented through a comprehensive literature review and analysis, the majority of studies and research focusing on Alternative Performance Measure has been developed in US and within a US GAAP environment. They screen through published articles in the last decade, and critically review a wide range of literature from the United States (U.S.), Europe and, to a less extent, Australia/Asia. In particular, as they impressively compile a really comprehensive sample of more than 400 research papers published in academic and professional journals as well as other publications which are important in the academic discourse, the results of their analysis are important to orient future research, as the authors also state is one of their purposes. They deploy the Systematic Literature Review technique on their sample and they find that APM reporting has become a well-established phenomenon in global financial reporting practice since the late 1990s. For years it has been an internationally established component of financial communication, especially in the capital market communication of large, public and listed companies. They report that especially after 2010 the number of published articles on APMs has increased sharply reaching a peak in 2020 and 2021, what proves the relevance of APM research. But this reality is biased as it represents mainly US, while research is lacking or underdone in Europe and in the IFRS jurisdictions. Therefore, more studies are needed with a focus in other countries except for US.

There are several ways on how to use APMs for external reporting but also for internal funds management. In 2009, Hocquard et al present a new alternative performance measure (APM) which evaluates the marginal distribution of a given fund and its' dependence (correlation) with a reference portfolio. They argue that this performance measure is of particular value in assessing hedge fund return as the latter are selected not only for yield enhancement but also for their diversification benefits. The methodology offers a unique metric for hedge fund performance evaluation but is a tool of using APMs not for reporting, but for internal analysis purposes.

In 2021, Hoitash et al proposed a method of using several alternative performance measures for financial statement benchmarking (FSB). They proposed a pairwise measure of financial statement benchmarking (FSB) that captures the degree of overlap in the financial statement line items reported by two firms. This is validated by showing its association with actual peer choices by analysts for performance benchmarking and by corporate boards for compensation benchmarking. They find that analyst (board) chosen peers with low pairwise FSB are more likely to be optimistically (opportunistically) biased and that the set of peers assembled by an analyst (board) collectively having low FSB is associated with more optimistic and less accurate earnings forecasts (higher CEO overpay). They also document that using peers with high FSB increases the

explanatory power of peer-based valuation models. Finally, they demonstrate alternative applications of FSB by aggregating the pairwise measure at the firm level as well as decomposing it into finer financial statement-specific components. Their evidence collectively suggests that FSB can be a relevant tool for those who use benchmarking applications, including practitioners and academics, and within this framework, APMs are tools of pairing and benchmarking.

Pham et al (2007) focus on performance measures and governance of companies. They find that despite the general acceptance of the role of corporate governance, empirical research has remained inconclusive regarding the extent to which individual monitoring mechanisms enhance firm performance and shareholder value. In particular, most previous studies have not convincingly overcome two critical difficulties: the potential endogeneity associated with monitoring mechanisms and the lack of an accurate and stable measure of performance. Therefore, they use a sample of the top 150 Australian firms by market capitalisation from 1994 to 2003, to examine the relationship between firm performance (measured by Tobin's Q and Stern Stewart's EVA) and corporate governance. However, similar to evidence from other studies they do not find a significant relationship between either of the performance measures and corporate governance. The results suggest that similar to Tobin's Q, EVA is too noisy as a performance measure to register any impact of governance mechanisms.

In a similar endeavor to study the usefulness of APMs, Zanten et. al in 2022 try to introduce commonalities between APM reporting and sustainable and integrated reporting. They argue that although sustainable reporting is becoming a mainstream ambition, investors disagree on how to best measure corporate sustainability performance (CSP). Environmental, Social, and Governance (ESG) ratings are the dominant CSP metric in the market, but they focus on financial materiality rather than sustainability impact. They introduce a novel alternative CSP metric that measures companies' impact on the Sustainable Development Goals (SDGs) and develop three tests to assess if it enjoys discriminant validity. Their study, even not focusing on APMs specifically, is important because it shows that APMs could be of a good use beyond financial reporting only, and can be included in sustainability and integrated reporting frameworks.

Similar studies on APMs are that of Steinki et al (2015) who review five popular performance ratios: Calmar Ratio, Omega, Sharpe Ratio, Sortino Ratio and Treynor Ratio. They discuss each ratio as per the following subsections: history, basis, formula, strengths & weaknesses, boundary values of the function & improved variations of the ratio.

Brinkman in his thesis in 2019 investigates which contextual factors influence the decision to disclose alternative performance measures. Using a worldwide sample of 926 high and mid-cap firms over the period 2013-2017, the results from a multilevel logistic regression indicate that the accounting standards followed, board independence and the legal system significantly influence the decision to disclose alternative performance measures. Moreover, it is found that the effect of board independence on alternative performance disclosure depends on the legal system. The results of his study indicate that most of the contextual factors had a significant effect. The factors that have a significant influence on the likelihood of disclosing alternative performance measures are the accounting standards, board independence and legal system. Institutional ownership and high-tech industry were found to be insignificant. Moreover, the firm controls size, tangibility,

profitability, growth and leverage were significant factors as well. The results also confirmed the directions of the predicted relationships, except for institutional ownership. However, this variable did not have a significant effect on the disclosure of alternative performance measures which means that it is not an important determinant according to the results.

Literature review suggests that there are a lot of areas that could be completed with research on how APMs are affected and are impacting the financial performance of entities. One specific topic to focus on is the practices currently followed by companies who have decided to disclose APMs. What measures specifically are they disclosing, and is there any commonality or order in the vast pool of APMs reported?

Methodology and Data Sample

As reported by Herr, Lorson & Pilhofer (2022) the literature review on APMs in Europe is not as rich as in US and this study aims to fill the gap and provide an analysis of the APMs that big European corporations include and disclose in their financial statements. In our study we prepare a sample of fourteen enterprises that are all listed in one of the stock exchanges in the EU. The entities included in the sample are not randomly selected; instead they are selected purposefully to prepare a meaningful representation with at least two companies from each of the six most important economic sectors in the EU (the pharmaceutical, telecommunication & IT, beverages, food, apparel & fashion and industrial entities).

The list of the companies in our sample is provided in table 1 below. We have paired the companies according to their main business activities in order to try and look for any potential similarity in the APMs they are choosing to disclose. On some occasion, more than two companies are identified and analysed per sector, without any intention or prejudice.

Table 1: List of EU big public companies analysed by authors.

No	Company	Sector
1	SANOFI	Pharmaceutical
2	BAYER	
3	VODAFONE	Telecommunication and IT
4	ORANGE	
5	SAP	
6	ABinBeV	Beverages
7	HEINEKEN	

8	NESTLE'	Food
9	DANONE	
10	LVMH	Apparel and Fashion
11	KERING	
12	DAIMLER	Industrial
13	BMW	
14	VOLKSWAGEN	

Source: Authors of the study

We screened the entities annual reports issued in 2022 and 2021 thus studying financial year 2019, 2020 and 2021. The analysis of their annual reports consisted in the following areas that are deemed important also by studies carried out before by auditing companies and standard setters (Mazars; EY and ISACA). Therefore, we had the following three objectives while we analyzed our sample.

the identification of the APM indicators frequently used by the entities in the sample. We have classified the APMs in three categories, such as performance indicators, financial situation indicators and cash flows indicators to have a better understanding on which was the focus of reporting for each of the entities and if there was any commonality or similarity within sectors.

Detecting any key divergences across entities belonging to the same sector in the labelling and calculation of the same or similar indicators.

the assessment of the level of disclosure provided about the definition and reconciliation of the APMs. This is one of the hottest topics of non-comparability among entities and one area specifically mentioned by regulators.

The identified APMs were grouped in three main categories and if any of the entities in the sample used a variation of any of previously identified APMs, or if the entities had used another new indicator, we have included that in the dataset by extending the variables examined.

Performance indicators. Three measures, the Cash Earnings, EBIT and EBITDA were included in this category as mainstream indicators of alternative performance appraisal. Cash earnings are commonly calculated by adding back to the net profit the depreciation and amortization and other nonmonetary expenses. EBIT is calculated by adding back to the net profit the interest expenses and taxes. EBITDA looks like a combination of the two indicators above as it is calculated by adding back to the net profit both the non-monetary items and the interest expenses and taxes. These three indicators are among the most commonly used APMs by entities, as far as we can observe from their financial statements.

Financial Status indicators focus on analysing the financial position of the entity. Initially two measures, the net financial debt and gross debt were included in this category. Gross Debt usually reports the amount of what is known as financial liabilities, thus excluding from total liabilities those items that are of an operating nature or origin (salaries payable, trade payables, etc). The net financial debt starts with the gross debt and deducts the amount of cash and cash equivalents the entity holds, in that it aims to compute the remaining liabilities after the entity covers a part of them through its cash reserves. Both these measures are widely used recently to report on the financial position of entities.

Cash flows indicators focus on the liquidity status of the entity. Free cash flow and the underlying profit were initially included in this category. Free cash flows are most commonly calculated by deducting the capital expenditures amount from the cash flows from the operating activities, thus revealing how much “free cash” is left for shareholders for them to use in their daily business. Whereas the underlying profit is one of the most debated APMs in that it is basically an adjusted amount of profit for all those items that the management “feels” do not represent core expenses for the activity. In one survey from the Financial Reporting Standards Board in UK in 2017 it was very interesting that all the analyzed companies except for only two of them reported the underlying profit to be higher than the net profit. This draws our attention to the real value of the APMs in interpreting the cash position of the entities.

Sometimes variety in reporting the APMs was noticed in our sample. The label would be for example *organic cash flow* instead of *free cash flow* or EBITDAal instead of the simple EBITDA where the former adds back the special losses of the company (Orange Plc.). Sometimes instead of reporting the underlying profit or the “adjusted”, core” profits, the Core Earnings per share were reported (case of Bayer), or Adjusted Basic Earnings per Share (case of Vodafone).

Certainly, we have to keep in mind that as there is no regulation and standardization on the definition of an APM there is a large variety on the way the same APM is calculated across different companies. These differences in the formulas used should be taken into account in every attempt to perform a comparative study as this one, and this is why one of our objectives here is to go beyond mere figures and labels and read the definition of an APM to understand its meaning.

Data Analysis.

A careful analysis of annual reports or integrated reports of fourteen big public companies in EU revealed that they were all engaged in disclosing and reporting Alternative Performance Measures. The extent of disclosing these APMs was in fact varying by a lot having companies that report as many as possible as well as companies that are very limited in providing this type of information. The detailed results of this analysis are presented in table 2 and they help to tackle the first major objective of this study “the identification of the APM indicators frequently used by the entities in the sample”. We start with three predefined categories: performance, financial status and liquidity, each of them represented by several commonly used APMs. We use a simple form of comparative analysis among entities by combining them in pairs (sometimes more than 2 companies), representing different sectors.

Table 2. APMs disclosed by the sample studied by authors.

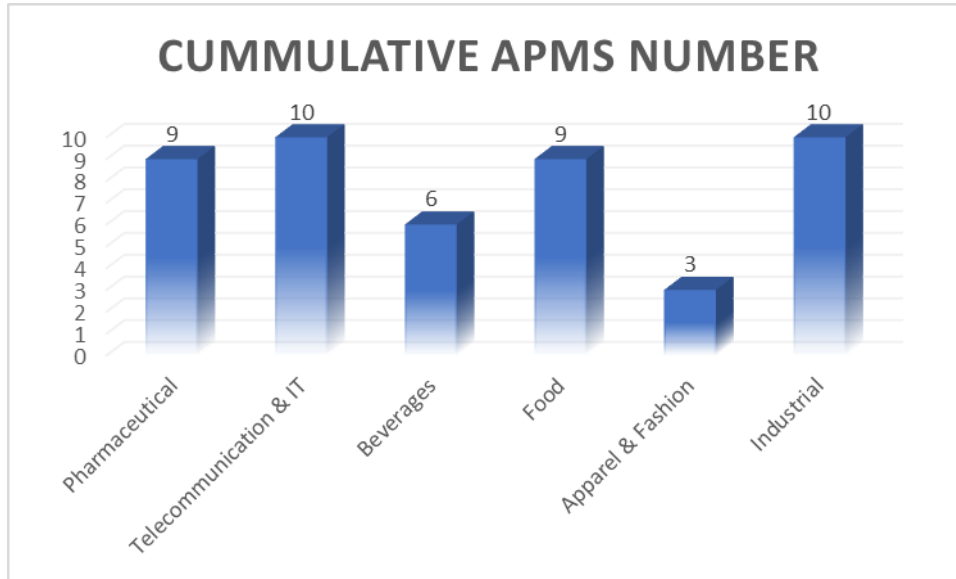
No	Company	Performance indicators			Financial Status		Cash flow and liquidity	
		Cash Earnings	EBIT	EBITDA	Net Financial Debt	Gross Debt	Free Cash Flows	Underlying Profit
1	SANOFI		Y		Y		Y	
2	BAYER	Y	Y	Y	Y		Y	Y
3	VODAFONE	Y	Y	Y	Y	Y	Y	Y
4	ORANGE			Y	Y		Y	
5	SAP	Y		Y	Y		Y	Y
6	ABinBeV		Y	Y				
7	HEINEKEN		Y	Y	Y		Y	
8	NESTLE'			Y	Y		Y	Y
9	DANONE	Y	Y	Y	Y		Y	
10	LVMH						Y	
11	KERING			Y	Y			
12	DAIMLER	Y	Y	Y	Y	Y	Y	Y
13	BMW		Y				Y	
14	VOLKSWAGEN	Y	Y	Y	Y	Y		Y

Source: Authors of the study.

We can see that there are companies that are engaged in disclosing all of them (such as Daimler), but also there are entities that report only on two or three of them, and focus more on either traditional financial ratios, or non-financial reporting, or both of the above. Chart 1 shows the cumulative number of APMs disclosed by the companies included in our sample (the telecommunication & IT, and the industrial sector which are represented by three companies in our sample instead of two, are adjusted accordingly). Overall, we witness an interest by the

companies to disclose qualitative and informing Alternative Performance Measures, and in our study we also offer a classification of the most used APMs found in table 2.

Chart 1. Cumulative number of APMs disclosed by companies in various sectors.



Source: Authors of the study.

Detecting any key divergences across entities belonging to the same sector in the labelling and calculation of the same or similar indicators was another objective of our study. Examining the choice of the entities in our sample there are several findings we come across at.

First, we notice that there are several “original APMs”, that is APMs that do not follow the main trends already established. For example, companies such as Bayer and Vodafone do not disclose the *underlying profit*, but instead focus on a “core” or “adjusted” *Earnings per Share* which they think is of a better use in terms of investors point of view. Orange is also a pretty creative company as it introduces two APMs which are slightly adjusted: the *EBITDAal* which instead of the simple EBITDA takes into account also the special losses and the *Organic Cash Flows* instead of Free Cash Flows. Orange also offers the ratio *Net Debt / EBITDAal* as an innovative APM in its financial statements. Vodafone, the other telecommunication company in the sample also presents an original APM, the *autonomous growth*, that focuses on the retained earnings retention rate. Bayer also discloses *NOPAT* instead of cash earnings. The more companies we include in our sample the more variety we will have regarding the APMs used and disclosed, but as a general rule we observe that companies engaged mostly in innovation, and R&D are also using very creative and special APMs.

Second, we notice that companies operating in the beverages sector and those operating in the apparel & fashion sector (especially the latter) are not disclosing as many APMs and instead (if we carefully analyse their annual or integrated reports) they focus more on the non-financial reporting, sustainability and climate related which is gaining prominence recently especially regarding these two industries. The disclosure of the sustainability or climate related indicators is not the focus of this paper, but we may mention some of them here, such as the carbon gas emissions, the reduction in waste, better water management and clean business (not using child labor or not testing products in animals). Yet, the focus of these companies on the non-financial indicators should not be seen as a compensation for the lack of use of the APMs, because each set of indicators has its own relevance.

Third, it is observed that more APMs in general are disclosed from companies operating in telecommunication, industrial and pharmaceutical industries. These companies are also among the most creative ones, introducing new measures and adjusting the existing ones according to their own specific activities. Of course, this remains a very general observation and a better assessment of the issue based on a larger database would be needed.

The last objective of this study was the assessment of the level of disclosure provided about the definition and reconciliation of the APMs, we found that companies were in general following the guidelines of ESMA in providing clear definition of their indicators, comparability with measures from previous years and also reconciliation with the line items from the financial statements itself. *One major weakness noticed though was the fact that only but a few of them clearly argued the reasons of reporting the specific APMs of their choice.* So, after analysing them, for most of the entities is not clear enough why management puts more importance on these specific measures and how they are supposed to help in understanding better the activity of the enterprise. As a recommendation of this study, we put forward the need to have full information on why entities are disclosing (or not disclosing) certain APMs and how to relate this information, with other pieces of financial and non-financial information.

Main findings and conclusions

In this paper we analyze the current status of APMs reporting across big public companies in Europe. As previous studies have revealed, the status of APMs research is underdone in Europe and other countries except for the US, and it is here that this study aimed to contribute. The use of the alternative performance measures has increased substantially and the regulators still need to catch up with the trend and are doing so by performing analysis, issuing guidelines and studying the situation from close. The same trend should be followed by empirical research which should focus on how the APMs are used, and if they are adding value to financial reporting at all or not, thus serving as orientation for both regulators and entities.

The objective of this study is threefold. We aim to: (1) identify the APM indicators most frequently reported by the big companies. Classifying the APMs in three categories, performance, financial situation and cash flows, will allow a better analysis and understanding on which was the focus of reporting for each of the entities and if there was any commonality or similarity within sectors; (2) detect any key divergences across entities belonging to the same sector in the labelling and calculation of the same or similar indicators; (3) assess the level of disclosure provided about the definition and reconciliation of the APMs.

We build a sample of 14 big listed companies in EU from six different sectors (pharmaceutical, telecommunication & IT, beverages, food, apparel & fashion and industrial entities). We study their annual and / or integrated reports for 2021, 2020, and 2019 for some of them. We screened through the major part of the reports, the Management Discussion & Analysis, the Financial Highlights, the explanatory notes and other, wherever an APM was disclosed and reported.

We found that there is a big interest from companies to disclose qualitative, informing and properly classified Alternative Performance Measures. We detect several areas where different entities have different focus as to which APM is more important for them to be disclosed. Companies operating in the food industry and those operating in the apparel & fashion sector (especially the latter) are not disclosing as many APMs and instead (if we carefully analyse their annual or integrated reports) they focus more on the non-financial reporting, such as the sustainability and climate related indicators.

More APMs in general are disclosed from companies operating in telecommunication, industrial and pharmaceutical industries. These companies are also among the most creative ones, introducing new measures and adjusting the existing ones according to their own specific activities. Companies such as Bayer and Vodafone focus on a “core” or “adjusted” Earnings per Share. Orange introduces two “new” APMs which are slightly adjusted: the EBITDAal which instead of the simple EBITDA takes into account also the special losses and the Organic Cash Flows instead of Free Cash Flows.

We also found that companies were in general following the guidelines of ESMA in providing clear definition of their APMs, comparability with measures from previous years and also reconciliation with the line items from the financial statements itself. Not many of them though were keen in providing direct information on the reasons of reporting the specific APMs of their choice.

This study is limited in several ways which further research may overcome and study better. A more extensive database including more companies and applied on a more comprehensive timeline for more financial years would provide more reliable conclusions. Also, the use of some more advanced methodology instead of a simple comparative-across-sectors approach that is followed here, could reveal important trends not only among sectors but also if there are any improvements in the APMs disclosure after the issue of the ESMA guidelines.

As a recommendation of this study we put forward the need to have full information on why entities are disclosing (or not disclosing) certain APMs and how to relate this information, with other pieces of financial and non-financial information.

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Opportunities and challenges in transitioning to circular economy in Albanian construction industry

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Abstract

Since the construction industry causes a high degree of waste in Albania, it is necessary to transition to a circular economy, where reuse and recycling of materials as well as waste management are highly prioritized. Therefore, an increase in circular economy knowledge is needed to develop circular solutions in the construction industry.

The aim of this study is to investigate the opportunities and challenges in transitioning to circular economy (CE) in Albanian construction industry. It provides an overview of the current situation regarding the circular economy (CE) and its application in the construction industry in Albania.

The study method is qualitative and is based on semi-structured interviews where the respondents represent different roles in the construction industry.

The study shows that the contractors' motivation to make a transition to circular economy is based on mandatory laws and regulations and competitive advantage. The Albanian construction industry is facing difficulties in understanding the concept of circular economy and in its managerial implementation.

Keywords: Circular economy, waste management, construction industry, Albania

Jel Code: M1 , M2

1. Introduction

In the Republic of Albania, the concept of 'circular economy' is at an early stage. The circularity concept has been introduced in January 2018 in the draft Strategy on Integrated Waste Management (2018-2023). This strategy is developed over the vision of "zero waste", serving the circulatory criterion of use and preservation of raw material resources. Thus, Albania has just started the transformation from a linear economy based on the 'take-make-dispose' approach towards circular economy which allows for a more ecological use of natural resources, low carbon

emission, energy saving, and environmental protection. (Com 2019) Moreover, a circular economic system stimulates the competitiveness between enterprises by creating innovative solutions, expanding the job market and building social integration as indicated in the Agenda for Sustainable Development 2030. (Com 2019; Co-PLAN 2020)

The European Union's most recent effort to circular economy is the Circular Economy Action Plan. The conversion from linear to circular economy business models was a prominent theme of the first Action Plan, which was released in 2015. The goal of the Action Plan was "reduction of waste through prevention, reduction, recycling, and reuse". (European Commission 2015) As a part of the European Commission Green Deal, which consists of a package of ambitious measures aimed at creating a sustainable European economy, the New Circular Economy Action Plan was published in 2020 to orient the economy towards the prevention of products becoming waste by employing re-use or recycling. (European Commission, 2020) As for the construction industry, the highest expectations are laid upon the waste reduction targets.

Albania has yet to develop its Circular Economy framework, but it is still facing difficulties with the implementation of EU directives in the context of the two phases of circular economy, respectively waste management and resources management. The difficulties come mainly as a result of the lack of solid infrastructure, capacity building and resources an unclarified coordination between institutions (central or local) which are in charge for implementing EU directives. (Co-PLAN 2020) (Maleš, I. 2020)

In Albania there are still no acts or dedicated legislation requiring a transition to circular economy. Although there is a Strategy Policy Paper and Integrated National Waste Management Plan 2020-2035 published by GIZ in collaboration with the Ministry of Tourism and Environment, which indicate the aim for transition from linear economy to circular economy. (The Ministry of Tourism and Environment 2018; COMMISSION STAFF WORKING DOCUMENT Albania 2020)

Waste creation is continuing to rise and is estimating a 70% increase by 2049 (Durrani, 2019). The construction industry is at the forefront of waste creation and accounts for 32% of the world's final energy usage as well as 40% material consumption which translates to more than three billion tons of raw materials (Leising et. al, 2018; 2020). According to European Commission the construction industry generates more than 35% of the total amount of waste in the European Union. (European Commission, 2020)

The main barriers for adopting the circular economy approach in the construction industry, as identified by the academia, are the lack of confidence in the quality of the recycled materials, due to a lack of quality standards, and undeveloped markets for the recovered materials. (Badraddin, A.K.; Rahman, R.A.; Almutairi, S.; Esa, M. 2021)

This paper aims to explore the Albanian construction industry situation regarding circular economy and what opportunities and challenges are associated with transitioning to circular economy.

Literature Review

Circular Economy (CE) derives from sustainable development which is an economic, environmental, and social development that meets the needs of the present without compromising the needs of future generations (Baumgartner & Rauter, 2017). According to Peter Lacy, CE is a systematic approach to economic development that strives to retain resources in productive use for as long as feasible in the economy while simultaneously decoupling growth from the consumption of scarce resources. (Lacy, et al., 2020).

Currently, about two-thirds of the material extracted from the planet ends up as waste and only 9 percent of the materials are recycled (Kunzig, 2020). In CE, the target is close to 0 percent waste and pollution. Thus, CE pursue to create an industrial system that is able to regenerate nature by favoring renewables over non-renewables and gaining profits through restorative models.

The academic literature on CE provides three categories of drivers - societal, regulatory, and economic - to transitioning to CE. (Rantaa, et al., 2018; EMF, 2013; Lacy, et al., 2020)

The societal driver for CE is the increasing social sensitivity to environmental problems such as the rising average global temperature and air-pollution, new pandemics, melting ice caps and glaciers and rising sea levels. In the EU more than 90 percent consider this issue a serious problem (Eurobarometer, 2021), and the social impact as a key driver to transitioning to CE.

The regulatory driver includes the methods through which governments and intergovernmental organizations can support and accelerate the transition to CE.

The regulatory drivers are considered to have a crucial role in facilitating the transition to CE through various governmental methods including legal frameworks, taxes, incentives, infrastructure development. One key regulatory driver is the government requiring industries to follow certain sustainable waste management practices. (Rantaa, et al., 2018) Failing to comply with these regulations can result in additional inspections, penalties, fines for companies.

The government, through the National Territory Council, has approved the National Plan for Solid Waste Management on 1st of January 2020. The principles of circular economy in Albania are referred to in the draft National Strategy for Integrated Waste Management (2018-2023) and also

in the document of Strategic Politics and National Integrated Waste Management Plan 2020-2035 with the aim of transitioning from linear to circular economy. (National Sectorial Plan for Solid Waste Management Albania 2020)

However, Albania lacks the plan and infrastructure to manage wastes in an environmentally friendly manner of reducing, reusing, separating collection of waste materials and recycling, regarded as the most ecological practices. The general trend of waste management is by depositing them in landfill sites (run by the municipality and illegal ones), burning them in the open air (mainly household wastes) and incinerators.

In terms of economic drivers, the globally increase in consumption raises the demand for raw materials as well as raw materials prices. Businesses are investing into recycling and reusing materials, due to the technological advancements which allows process innovations, new value creation and access to green markets (Aloini, et al., 2020).

Circular Economy is an approach to sustainability which uphold economic growth by lowering carbon emissions, virgin material consumption and regenerating nature and land productivity. (Horbach, et al 2015)

CE in the construction industry has recently started to gain significant attention from scholars, mainly studying the subjects of waste management and reusability of materials. (Hopkinson, et al., 2019). According to Pomponi and Moncaster (2017), CE may provide the construction industry significant opportunity to lower greenhouse gas emissions, overall energy use, and waste creation. Instead of linear business approaches that generate enormous amounts of waste, CE can ensure resource optimization and sustainable production that minimizes waste (Govindan & Hasanagic, 2018). Lemaitre et. al, (2019) has also supported that the implementation of Circular Economy practices would limit waste generation and unnecessary resource usage.

Another study by Silva et al., (2019) concluded that the full potential of utilization from recycled aggregates has not reached yet due to the lack of knowledge and confidence in materials within the construction industry. Crawford et al. (2017) consider the time and cost associated with recycling and sorting the waste as a major barrier besides other barriers such as lack of incentives, lack of education and ingrained industry culture. The absence of financial incentives and knowledge about used items and components have both been identified as barriers to the construction industry's adoption of CE.

Previous research also shows that collaboration between stakeholders along the value chain is crucial for the sector to avoid value loss. All stakeholders including wholesalers, contractors, designers, demolishers, material suppliers, and project management teams should work together in harmony and share the responsibilities around circular models within the entire supply chain (Arup & Bam, 2017)

Sustainable waste management in Albania remains at a relatively low level. Currently, about 69% of the population receives waste management services; only 30% of waste is dispatched to the landfill, while the rest are disposed on inadequate deposit sites. Regarding the infrastructure and type of landfills, there are no landfills designed to meet EU standards. Most of the waste is deposited on local and illegal landfills. (ENV 2021)

Although there has been some minor effort from municipalities to maintain a cleaner environment, it is the poor infrastructure of dumpsites, insufficiency of waste collection vehicles and weak law enforcement that hinder the improvement of the situation.

Unfortunately, there are no accurate data on the amount of waste generated by the construction industry in Albania. This research paper aims to explore whether a circular economy approach has been adopted by the industry and understand the current situation among construction firms.

Methodology

This study adopts a qualitative research approach using semi-structured interviews with experts of the construction industry. The qualitative research complements the explorative nature of the study. Exploratory studies aim at discovering and understanding phenomena and gaining insights instead of offering conclusive answers (Blaikie, 2000). A qualitative study helps to understand the contextual setting and perceptions in the initiatives within the construction industry.

In qualitative research, sampling is carried out more purposefully rather than randomly. The generic purposive sampling approach is chosen because it enables deliberate selection of interviewees based on their propensity to advance theoretical knowledge of a topic. Generic purposive sampling is frequently employed in business research (Bryman, et al., 2019).

Six semi-structured interviews were conducted with construction professionals from different construction firms in Albania to collect rich information on their experience and perception to Circular Economy.

To ensure confidentiality, only the positions of the interviewed are mentioned, instead of the companies' names. A summary of the respondents is shown in Table 1

Table 1 Respondents per position in the industry

Position in construction company	Respondents
Construction Manager	Respondent 1
Project Manager	Respondent 2
Architect	Respondent 3
Supervisor	Respondent 4
Engineer	Respondent 5
Sales and Marketing Director	Respondent 6

A thematic analysis was conducted to understand the level of acknowledgement and adoption of the principles of Circular Economy by the construction companies. This method enables researchers to divide data sets into themes and analyze, trace, and observe repeated patterns (Braun & Clarke, 2006). It enables to gather relevant data through coding (Bryman, et al., 2019) and analyze the differences and similarities when comparing different interviews.

Findings

Through thematic analysis was investigated the level of acknowledgement and adoption of the principles of Circular Economy by the construction companies and the unique challenges and opportunities the sector faces in transitioning to CE.

When asked about the CE acknowledgement level, respondents indicated a low level of awareness and involvement in CE practices in the industry.

We have low awareness on circular construction on the management level of our clients. None of them has ever asked how they can make the buildings more circular. I think they do not understand what that means. R3

*The construction industry has not started acting in the circular direction yet. There are some test projects promoted but there are no solid practices in the industry. **R1***

*We definitely need knowledge and expertise in order to think and act on circularity level. It has been promoted on a general level, encouraging the construction firms to be more sustainable, but we are still missing its application. **R2***

When asked about what drives the transition to CE for construction industry, the key drivers resulted in :

Legislation

Although Albanian Legislation addresses circular economy with waste management issue of the construction industry there are still no acts or dedicated legislation requiring a transition to circular economy, no subsidy or support for those who reduce, reuse or recycle waste.

*A substantial contribution to the transition to a Circular Economy would be taxonomy regulation. **R1***

*Only if sustainability is related to monetary benefits, than it will get a push in the industry. **R6***

All the respondents agreed that a taxonomy regulation would support the transition to environmentally sustainable economic activities.

*The Government is responsible for directing the construction companies towards sustainable expenditures. **R5***

Customer

*The customer requirements are indirectly pushing us towards Circular Economy solutions. **R1***

*As we are a contractor, our customers, tell us what they want in terms of sustainable materials and practices which accelerates the connection of CE to the business. **R2***

The demand from the customer for more circular and sustainable practices is not significant, that we are actually not including it amongst our operations. R6

All respondents agreed that the current demand from the customer for more circular and sustainable practices is low, but it is considered a key driver after the government regulations for transitioning to the circular economy.

Social responsibility

Albanian construction companies are realizing their responsibility in lowering their impact on the environment. The construction companies annually report information about their environment and sustainability work showcasing their social and economic performance.

To be a sustainable constructor of the society is part of our vision statement. R6

There is more awareness for reducing the construction and civil engineering industry's considerable environmental impact. R5

In terms of waste management construction companies mainly view Circular Economy to reduce the environmental impact and lower damage in the environment, rather than to reduce cost and increase profitability. An important aspect of waste management is waste sorting. The construction companies are more focused on improving their waste sorting sent to landfills that includes materials as plastic, bricks, concrete, ceramics ect.

In terms of reducing the energy use and using renewable fuels instead of fossil fuels, companies aim to adopt electric substitutions to minimize dependency on fossil fuels, but is out of their capabilities to build up the infrastructure for green energy.

I think it will take some time to build capacity and to change processes in the industry. R1

Conclusion

The purpose of this study is to provide an overview of the current situation on CE application in the construction industry in Albania and the opportunities and challenges in transitioning to circular CE.

Findings imply that construction firms in Albania are working and operating with linear business models. CE is a quite a new concept in the construction industry and most of the industry representatives lack knowledge towards CE practices. Companies are aware of the aspects of circular economy such as recycling and reuse but are in the very early stage of the adoption.

All construction firms are profit orientated corporations and there is a lack of proper circular business model in the industry.

Research findings indicate that CE is a recent concept, and the construction companies cannot use it, unless a circular system of recycling and reusing is implemented by the government. The legislation is identified as key tool to affect the industries transition to CE and the government should keep implementing policies to motivate the adaption of sustainable practices. While customers and social responsibility of stakeholders have been identified as important drivers, but right now the Government and EU policies are the real accelerators for the transition to circular practices.

Circular practices can bring massive benefits to the sector both environmentally and economically. The complex structure of the industry has been identified as the major challenge while the effects of the legislation on construction companies regarding the implementation of circular economy is an opportunity to be further studied.

An important finding is the lack of research in the field. To apply and monitor the progress of circular economy of the construction industry and the country at large, accurate and easily accessible data is needed for each sector, mainly the sectors that are essential to the development of a circular economy.

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Data-Driven Prediction-Making on customer churn in a circular economy through RFM and clustering algorithms

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Abstract

Enterprises are facing the two-sided challenge of adapting from one aspect to the needs of the new emerging circular economy requirements and the tough competition deriving from new emerging digital business models, hence they must develop innovative strategies to identify customers and serve them based on their behavior and characteristics. Identification of customer clusters serves as a basis for an appropriate strategy to predict customer churn. There are many different models and algorithms to use for customer segmentation, each with specific characteristics. Some of these models and two of many frameworks that use a combination of the algorithms are explained in the second section of this paper.

The methodology is explained in section three, represented by a survey in the coffee industry. The purpose of the survey is to collect customer data based on predefined variables, which will serve as additional information on the RFM analysis. On the last section we have concluded with a proposition of a new integrated method for customer clustering, which will be part of our future work.

Keywords: circular economy, customer churn, RFM, cluster algorithms.

1. Introduction

Predicting and evaluating customer behavior, especially predicting customer churn, has a strong impact on the success of a business. For businesses is important to understand better customers performance and develop a predictive model to analyze and identify churning users. The main focus of companies is to classify valuable customers accurately and quickly among the large amount of data. There are various flavors to define user churn in different industries.

The purpose of many companies nowadays is to find new or improved algorithms for better customer evaluation. Companies need to understand and analyze the customers' data better in all aspects. Detecting similarities and differences among customers, predicting their behaviors, proposing better options and opportunities to customers became very important for customer-company engagement [15]. However, businesses may not have the adequate tools and resources to conduct a real predictive model in a specific industry. Predicting accurately on a user level is hard, and constructing marketing campaigns to leverage these predictions is harder still [16].

The scope of this study is to compose a generalized end-to-end customer churn prediction framework that is applied to businesses across a wide variety of industries.

Different and new algorithms for churn prediction are present in this framework, and the best performing one is chosen for a specific business. Those new algorithms or improved ones, should result in better performance in terms of accuracy, processing speed, higher sensitivity, better segmentation for a specific data set.

It's important to know that each model is trained only on the business' own data leading to different configurations of the same approach.

2. Literature review

Dunn Index (DI) is a cluster validity to identify optimal number of clusters with the highest value having the best clusters [1].

Clustering is the process of grouping a set of various objects into groups of similar objects. A cluster is a collection of data objects that have high similarity in comparison to one another within the same cluster and are dissimilar to the objects in other clusters [5]. K-Means++ is a simple probabilistic means of initializing for k-means clustering that choose the initial values (or "seeds") for the k-means clustering algorithm [17].

2.1. Clustering algorithms

Analysis of DBSCAN and K-means algorithm [2] conducts in an analysis of these two algorithms using at first Dunn index to determine the best number of clusters.

Clustering algorithms, DBSCAN and K-means, are different because the first does not require the user to specify the number of clusters produced and has a better performance, as well. This has been demonstrated in the study [3] suggesting that DBSCAN has higher sensitivity and better segmentation for a specific dataset. DBSCAN is designed to find the dataset portion containing cluster and noise changing by using the Epsilon (eps) and Minimal Point (minpts) parameters that are useful in determining the distance and minimum number of neighbors and core point[2].

Moreover, DBSCAN can also find outliers in arbitrary clusters, to handle the noise. Outliers are objects in datasets that are much different from the rest of the objects in the data set [4] which do not contain enough number of points (minpts) in forming the clusters. Outliers are often discarded

because they are considered noise, but actually the detection of outlier data or so-called anomaly data is necessary if there is a dataset that provides important information to the system.

M. A. Farajian, Sh. Mohammadi, B. S. Bigham, F. Shams, in *Selecting Smart Strategies Based on Big Data Techniques and SPACE Matrix (FASE model)*[5], used the Fuzzy C-mean algorithm to clustering customers. Fuzzy-CMeans (FCM) is a fuzzy clustering method, based on K-means clustering concepts to partition collection of objects into clusters, i.e. FCM iteratively determines the cluster centers and updates the memberships of objects [6].

2.2. Classification Algorithms

Priyanka Rani, Nitin Mishra, Samidha D.Sharma, on their study [7] proposed HPID3 classification algorithm. After creating an innovative decision tree structure, it predicts future outcomes.

On the other side, conventional ID3 algorithm, firstly splits horizontally the sample of RFM dataset and then applies some mathematical calculations, to construct decision tree and then to predict future customer behaviors by matching pattern.

HPID3 algorithm significantly reduces the processing time mean absolute error, relative absolute error and memory space required for processing the dataset and for constructing decision tree. It is suitable for small or medium datasets. The performance of the proposed algorithm is analyzed by the standard RFM dataset and compared with the conventional ID3 algorithm using weka data mining tool where the results are better for the proposed technique[7].

Both the algorithms have been tested in different types of RFM dataset in various industries. According the experimental results, the proposed HPID3 algorithm is more effective than conventional ID3 in terms of accuracy and processing speed.

2.3. Algorithms for associations rules

The first algorithm for mining association rules, Apriori algorithm, was proposed in 1994 [5]. Zhou Xin, on his paper [9], introduces an improved RDBMINER algorithm and apply it to mine association rules in retail banking relational databases. The advantage of this algorithm is that it can directly mine association rules in relational datasets without converting relational data format to basket data format when applying such existing algorithms for basket data. It considers min_supp and min_conf in the process of finding ISIs and corresponding ISEs, and give its advantages over RDB-MINER algorithm.

The difference between existing RDB-MINER algorithm and the improved one is that the former considers support and confidence after getting all the ISIs, the latter considers support and confidence in the process of algorithm, the latter has better performance in time complexity, when the volume of data is very big, the performance becomes important, so choosing a suitable algorithm is very crucial[9].

The FP-growth method [10] is a depth-first algorithm, proposed by Han Etal, as a data structure called the FP-tree. Compared with other algorithms such as Apriori and its variants, which may need as many database scans as the length of the longest pattern, the FP-growth method only needs two database scans when mining all frequent itemsets. Also, it can be used the weighted mining frequent pattern based customer's RFM score(WMFP) for generating the weighted association rules[11].

2.4 Research models and methods for customer churn prediction: Data Mining Using RFM Analysis

Data mining is a methodology with a significant contribution in extracting the hidden knowledge and information from large amount of data. It has been used by researchers for solving different issues related with customer evaluation. In her framework [12], Derya Birant uses the RFM analysis to produce a better prediction for customer behavior and product recommendation.

The methodology starts with data preprocessing, which is needed to make a correct and easy discovery of knowledge [12]. Data preparation includes operations such as reduction in number of attributes, outlier detection, normalization, discretization. In this step, the following operations should be made:

- a. *Dimensionality Reduction*: All the attributes that are unnecessary, such as attributes that have only a few values or have only single value, should be deleted.
- b. *Filling in the missing values, taking in consideration the appropriate type*.
- c. *Handling the outliers, inaccurate values and removing them from the dataset*.
- d. *Transforming data into an appropriate format*. Discretizing the original values of continuous attributes, into a small number of value ranges, before association rule mining task.
- f. *Replacing low level concepts* (such as cities Istanbul, Ankara, or Izmir) by higher level concepts (such as states Marmara, Central Anatolia or Aegean) [12].

After normalization process of data, RFM analysis is applied by defining the scaling of R–F–M attributes. This process includes the following three parts:

- a. Sorting the data of three R–F–M attributes by descending or ascending order.
- b. Partitioning the three R–F–M attributes respectively into 5 equal parts and each part is equal to 20% of all. Each part is assigned with a number from 1 to 5. The '5' refers to the highest level, while '1' refers to the lowest level of contribution to revenue.
- c. Repeating the previous sub-processes for each R-F-M attribute individually [12].

The following steps consist on clustering using RFM. Customers are divided into numerous groups with similar RFM values and each customer is part of an appropriate segment. The main advantage of this process is to be able to adopt different marketing strategies for different customer segments.

It improves the quality of recommendation, helps decision-makers identify market segments more clearly and therefore develop more effective strategies. This framework proposes using KMeans++ [13] algorithm to find customer segments with similar RFM values. It determines the initial center points by calculating their squared distance from the closest center already chosen.

Through new seeding method, KMeans++ consistently finds better clusters than K-Means and yields a much faster because the initialization procedure that ultimately determines the number of iterations to run before stopping [12]. After determining the initial centroids, the algorithm assigns vectors to the nearest centroid using Euclidean distance and re-computes the new centroids as means of the assigned data vectors. This process is repeated over and over again until vectors no longer changed clusters between iterations [12].

After segmentation, classification rules are discovered using demographic variables (age, gender, education level etc.) and RFM values of customer segments to predict future customer behaviors. The following two sub-steps express the process in detail.

a. *Classification*: Using customer demographic variables and R–F–M attributes, classification rules are discovered by C4.5 Decision Tree [14] algorithm. C4.5 algorithm first grows an initial tree using the divide-and-conquer strategy and then prunes the tree to avoid overfitting problem [12].

b. *Evaluation of Classification Accuracy*: Commonly used validation techniques for classification are simple validation, cross validation, n-fold cross validation, and bootstrap method [12]. This framework uses n-fold cross validation technique because it matters less how the data gets divided. This technique, decompose dataset n subsets and the method is repeated iteratively n times. Each time, one of the n subsets is used as the test set and the other n-1 subsets are put together to form a training set. Then the average error across all n trials is computed [12].

The core concept of this work is to extract recommendation rules from each customer group, formed in the previous, by considering classification rules and using FP-Growth Algorithm [12]. So, the purpose of this step is to identify the associations between customer segments, customer profiles and product items purchased together [12]. By using such an algorithm, companies are capable of recommending products with associated rankings, which results in better customer satisfaction and cross selling. The detail process includes two sub-steps.

a. *ARM*: FP-Growth (Frequent Pattern Growth) is one of the Association Rule Mining (ARM) algorithms. It extracts the rules very fast from data by constructing a prefix tree and traversing this tree to generate rules. FP-Growth starts with converting the database into a frequent-pattern tree (FP-Tree). Each item in the header table is composed by an item name and a head of node link, which points to its first occurrence in the tree. After constructing FP-Tree and header table, the algorithm starts to mine the FP-tree by considering the items from the bottom of the header table and by recursively building conditional FP-Trees [12].

b. *Evaluation of Association Rules*: ARM algorithms use support and confidence thresholds and usually produce a large number of association rules which may not be interesting. An association

rule is valid if it satisfies some evaluation measures [12]. Evaluation process is conducted to cope with a measure in order to evaluate its worthiness.

2.5. Big Data Techniques and SPACE Matrix (FASE model)

Companies should consider some dimensions needed for selection of a suitable strategy for their customer evaluation process. The Big Data Techniques lie into some linked sub processes that generate the smartest output at the last phase. The following framework worked by a group of authors [5], presents FASE model based on Big Data techniques and SPACE matrix (Strategic Position & Action Evaluation.)

The first step of the whole framework is data preprocessing, that involves transforming raw data into an understandable format. So, it refers the normalization of data, where we remove the attributes which include missing values or inaccurate values, eliminate the redundant attributes, normalize all numeric values in the dataset and transform the raw data into an appropriate format for clustering customers [5].

During this sub-process, two datasets are integrated on a column to create a single dataset. Then the second sub-process was intended to extract only that data useful for the big data algorithms. Dataset contains unnecessary data fields and records which are removed. The next sub-process, the raw data, is transformed into a numeric format and then all of data in the dataset are normalized to a constant scale which will be more effectively processed [5].

This process tries to extract RFM values from one dataset, where R is a value measure that is reverse of the date of the time distance between the date of user's last transaction and the date of last transaction on the dataset. The value measure F is the average number of transactions per month. The value measure M is the average amount of financial transactions the user made per month. Another important variable, we need to cluster is the Customer's Transactional Behavior (CBT). It is an implicit variable which cannot be retrieved directly from the data base, so we needed to develop a method to extract the CBT.

As shown in the following equation, this study employs CBT to extract customer's transactional behavior:

$$CBT = \sum w_i sci/j \text{ where } w_i = 2(j-i+1)/j * (j+1)$$

The w_i indicates the degree of importance of SC; The recent SC is more important than other SCs. Where sci indicates the score of the customer during a month i , and the month j is the whole period of observation [5].

After data normalization process, FASE model uses the customers' dataset to analyze the customer behaviors. Fuzzy C-means (FCM) is a data clustering technique which provides a method of how to group data points that populate some multidimensional space into a specific number of different clusters [5].

The main advantage of Fuzzy C – Means clustering is that every object may belong to several clusters with diverse membership values that are between 0 and 1. Moreover, there is a fuzzy rule that states the sum of the membership values of an object to all clusters must be 1. Another

advantage of using fuzzy theory in customer clustering and CRM is that the business analyst can gain in-depth understanding into the data mining model. FCM algorithm is described as follow:

It is a fuzzy clustering method which is based on K-means, which determines the cluster centers and updates the memberships of objects. FCM attempts to determine the most characteristic point in each cluster then it computes the membership value for each object in the clusters to minimize the cost function. Input of this method involves RFM values and some important attributes that impact on strategic decisions.

Output of this process is membership values that indicate the degree to which every customer belongs to each cluster [5].

Then, the process continues with the association rule inducer, a method to generate the customers' profiles that contain practical patterns and important information. Association rule mining is a method for discovering relationships between a set of items that occur frequently together in a dataset [5].

FASE model finds association rules from clusters of customers by Apriori algorithm, applies on each cluster and takes as input RFM values and some important significant attribute values of each cluster. The extracted association rule creates profile of each cluster that can be used by strategic managers to realize their customer's behaviors. Once the customers' clusters are created, FASE model tries to understand practical patterns in customers' clusters so that it could better figure out behaviors of various customers.

Apriori algorithm is proposed for mining association rules in a transaction dataset. This algorithm contains two essential steps which are:

- 1) Support Satisfaction
- 2) Confidence Satisfaction

The first step is detecting all the association rules whose support is greater than a minimum support (MinSup); and the second step evaluates association rules to have confidence greater than minimum confidence (MinConf)[5].

In final process, FASE model evaluates strategic position and chooses high performance strategy for a corporation based on SPACE matrix method. SPACE analysis matrix is a super technique for assessing the sense and wisdom in a particular strategic plan. It includes four-quadrant, which indicates aggressive, conservative, defensive or competitive strategies [5].

The axes of the SPACE Matrix represent horizontal and vertical dimensions of a firm. The SPACE matrix contains the internal dimensions (Competitive Advantage (CA) and Financial Strengths (FS)) and external dimensions (Industry Strengths (IS) and Environmental Stability (ES)) [5].

These dimensions are the most important determinants of an overall strategic position of corporation in the market environment. Each of dimensions in the SPACE matrix has its own specific measures. In this process, internal dimensions and external dimensions are evaluated to find the strategic position of the corporation and then select the smartest strategy.

3. Methodology

During the research we conducted a survey, in order to have a dataset contains data about different factors affecting customer satisfaction in a coffee industry. The aim of the survey is to measure the company's customer satisfaction in customer service, quality of products and delivery, communications and customer experience to give the management a clear view of the company's customer satisfaction level.

We have chosen questionnaires as an instrument for data collection. The questionnaire has 15 general questions and is designed to capture some demographic variables that will be studied during the RFM analysis. The questions are organized to cover several aspects related to customer satisfaction. It contains open-ended questions and multiple-choice questions with predefined answers offering respondents the possibility to choose and rank among several options.

The survey was conducted from (04.06.2018) through (31.08.2018). This nationally representative survey was conducted online with (N) adults age 18 or older living in different cities of Italy. The survey consists of a total of X completed web and face to face interviews. All sample surveys are subject to possible sampling error; that is, the results may differ from those which would be obtained if the entire population under study were interviewed.

The margin of sampling error for the entire survey is plus or minus 2.5 percentage points at the 95% level of confidence. This means that in 95 out of 100 samples of this size the results obtained in the sample would fall in a range of plus or minus 2.5 percentage points of what would have been obtained if every individual adult in Italy had been interviewed. All the questions in this study have been cross tabulated by demographic and other characteristics, such as gender, age, education, and income.

Data preprocessing is the next step that involves transforming data into an understandable format, in which we remove attributes that include missing or inaccurate values, eliminate redundant attributes, normalize all numerical values in the data set and transform raw data into a format appropriate for creating customer clusters.

Choosing the right algorithm or method for dividing customers into clusters depends on the type of dataset, business needs, number of parameters, number of clusters etc.

4. Conclusions and Future work

It is difficult for a company to cluster customers in order to apply the right strategy for each group. It all starts with defining which will be the most suitable variables to use and then collect the information needed. One of the most important steps is to choose the method or the algorithm that is going to be used for grouping customers based on predefined parameters.

Basic RFM method, clustering algorithms, classification algorithms, are alternatives for customer segmentation. In our survey, we have concluded with a list of demographics, behavioral and transactional variables (RFM) needed for customer clustering.

The choice between the RFM approach and clustering depends on specific needs, use cases and resources of the organization. The use of only one of these may not be effective. This project suggests integrating these two methods. The RFM segments will serve as input for choosing the initial central points, used by a clustering algorithm. K-means ++ is one of the proposed clustering algorithms, in particular for its new seeding method.

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Responsibilities of construction project actors towards positive environmental impact in the context of the FIDIC Climate Change Charter

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Abstract

The FIDIC (International Federation of Consulting Engineers) Climate Change Charter, which outlines the fundamentals of addressing climate mitigation, adaptation, and resilience in the built environment, was published in November 2021. Although the Climate Change Charter has not yet had an effect on the drafting process, future adjustments are anticipated to incorporate sustainable business practices into the standard form contract.

This paper examines the responsibilities of the various parties involved in the construction industry as well as the possible courses of action for individuals, projects, businesses, and institutions towards positive environmental impact. In order for the sector to truly and significantly impact mitigating and enhancing the resilience of infrastructure and maintaining people's quality of life, it is imperative that organisations such as FIDIC lead by example. It will be essential to upskill the industry to handle the carbon reduction challenge by educating players in the industry to plan, design and execute for a low-carbon future through the sharing of information, case studies, and experience for construction project management in an easy-to-understand and simple way.

Keywords: FIDIC, International Federation of Consulting Engineers, construction, environmental impact, Climate Change Charter

Jel Code: L74, Q51

1. Introduction

The construction and operation of infrastructure is responsible for an estimated 70% of global carbon emissions, with concrete alone accounting for 7%. If we are to achieve net zero by 2050, the construction and engineering communities must play a critical and immediate role. [1]

Inclusion of the Republic of Bulgaria into European political, socioeconomic, and financial structures is unthinkable without a thorough study and familiarization with the legislation, legal framework, normative base, and other rules and documents used in European countries and international institutions, as well as without bringing our legislation, regulatory framework and

good practices in terms of Environmental impact in line with European ones and achieving maximum compliance. This fully applies to the construction industry in all phases of the investment process, including research, design, building material waste, construction contracting, equipment supplies and installation, performance control, acceptance and payment of completed works, services, commissioning, and maintenance during the warranty period and operation.

The responsibilities of the various parties involved in the construction industry as well as the possible courses of action for individuals, projects, businesses, and institutions towards positive environmental impact should be analyzed and communicated. In order for the sector to truly and significantly impact mitigating and enhancing the resilience of infrastructure and maintaining people's quality of life, it is imperative that organizations such as FIDIC lead by example. It will be essential to upskill the industry to handle the carbon reduction challenge by educating players in the industry to plan, design and execute for a low-carbon future through the sharing of information, case studies, and experience for construction project management in an easy-to-understand and simple way.

The FIDIC (International Federation of Consulting Engineers) Climate Change Charter, which outlines the fundamentals of addressing climate mitigation, adaptation, and resilience in the built environment, was published in November 2021.

2. Literature review

The construction industry has caused serious environmental issues, such as climate change and energy shortage, as using traditional methods for buildings generate 33% of greenhouse gases and consume over 40% of global energy. [2]

The BIM technology has helped to make it easier to manage and integrate information throughout a building's entire life cycle. BIM has the potential to be one of the most effective ways to handle this problem. [3]

Building materials and the construction industry as a whole have significant negative effects on the environment since they demand a lot of energy and resources during their manufacturing, usage, and even destruction processes. These effects of materials include ecological destruction, harm to human health, and global warming in addition to an increase in energy consumption. Prior to the design and construction of buildings, it is essential to examine and analyze building materials in order to identify risks and empower decision-makers to decrease such risks. [4]

Annually, more than three billion metric tons of raw materials are consumed to manufacture building materials and products around the world. The building industry is the second largest consumer of raw materials, after the food industry. [5]

To make buildings "less carbon-intensive over the course of their whole life cycle," the European Commission embraced the "life cycle thinking and circularity" idea in the Renovation Wave

initiative (European Commission 2020a). Whole-life carbon is anticipated to begin to be included into the policy framework as a result of the current evaluation of important policy and legislative files, such as the Energy Performance of Buildings Directive, the Energy Efficiency Directive, and the Construction Products Regulation. [6]

Other institutions worldwide also work in the direction of influencing the construction industry towards better environmental practices. FIDIC states that global action is needed to save and enhance our environment. According to the Briefing note from 2019, government, the public, and the commercial sectors must all participate in the effort. Additionally, FIDIC advises member groups to stay current on environmental trends around the world and to interact with and talk about environmental issues with experts from various fields. [7]

3. Tools and methodology

The linguistic, systemic, historical, and functional methodologies for interpreting legal frameworks in the construction business are applied in the current research. The four basic logical research methods are analysis, synthesis, induction, and deduction. FIDIC contract templates have been used to study the regulatory framework and the environmental impact of such authorities to the construction practices. The research outlines the specifics that are regularly encountered in construction contracting practice.

4. International Federation of Consulting Engineers (FIDIC)

Over the past 50 years, the International Federation of Consulting Engineers (FIDIC) contracts have evolved into the global norm for the consulting industry. On all kinds of projects, they are accepted and used internationally in numerous countries.

Due to the huge and frequently insurmountable variations between national jurisdictions, researchers and practitioners in the construction and legal sectors have questioned the feasibility of developing a "common law of construction contracts" across nations and regions. However, despite these gaps and differences, the application of FIDIC contracts has produced successful and functional outcomes when incorporated into the framework of national jurisdictions, indicating that there is sufficient substantive agreement upon which to construct and adapt FIDIC contracts and terms to the demands of national legislature. [8]

FIDIC users are already familiar with the current standard form contracts' environmental clauses: "The Contractor shall take all reasonable steps to protect the environment, both on and off the Site," says subclause 4.18 of the 1999 Red Book.

In the 2017 set of contracts, the Contractor's duty to protect the environment is changed from "reasonable" to "necessary."

Under subclause 2.3 of both the 1999 and 2017 suites, the employer is responsible for making sure that its employees and other contractors take "similar" (1999) or "the same" (2017) actions as the contractor under subclause 4.18.

The main problem is that 4.18 is not clear. There is no definition of "environment," and it is not clear what "reasonable" or "necessary" steps might be for the contractor and/or the employer's staff.

It is possible for FIDIC to make these rules stronger by adding, for example, additional requirements to meet certain sustainability ratings, to use sustainable materials and/or construction methods, or to take all steps possible to reduce the project's carbon footprint. Probably this is the direction that should be developed with the helps of the new initiatives within FIDIC. [1]

In addition to that, The FIDIC Board established the FIDIC Sustainable Development Group, also referred to as "the Body," as a working committee. Their main responsibilities are to:

Assess the construction industry's influence on the SDGs (Sustainable Development Goals) and advise consulting engineers on how to optimize this influence by creating strategies, tools, and training

Evaluate the potential impacts of climate change and offer a forum for consulting engineers to discuss ways to make structures, infrastructure, and cultural heritage more tolerant of climate change, mitigated, and prepared for it.

Suggest the best sustainability policies and practices to FIDIC.

According to FIDIC, the Engineering Industry is essential to advancing, supporting, and implementing the SDGs on a worldwide basis. In that sense, difficulties persist, and a wider worldwide consensus on uniform standards and certification procedures is required. [9]

FIDIC Climate Change Charter

The Climate Change Charter represents a significant new call to action by FIDIC, the global consulting engineering industry body which represents over 40,000 companies and more than one million professional engineers and consultants around the world. It outlines the fundamentals of addressing climate mitigation, adaptation, and resilience in the built environment.

This charter recognizes the agreement reached at COP21, or the Conference of the Parties to the 1992 United Nations Framework Convention on Climate Change, which took place in Paris, France, in 2015, and is known as the Paris Agreement. The Paris Agreement outlined goals for limiting the increase in global temperature to 1.5 degrees Celsius above pre-industrial levels, improving the capacity for climate adaption, and aligning financial flows with low-carbon and climate-resilient development.

According to FIDIC, there needs to be a fundamental change in how society, businesses, industries, institutions, and governments (on a worldwide scale) approach limiting temperature rise, mitigating its effects, fostering adaptation, and addressing the aforementioned problems. According to FIDIC, there is currently a global climate emergency. Over the next 30 years, this disaster will continue to worsen and will affect an increasing number of individuals and communities. By taking this position, FIDIC is working toward the following goals outlined in the FIDIC's statutes:

Act as a global representative for the consulting engineering sector.

Be the foremost expert on matters pertaining to business practice.

Encourage excellence in project management, risk management, and leadership.

Fight against and denounce bribery and corruption while advancing morality, honesty, and openness in business.

Promote diversity, equal opportunity, and inclusiveness. Encourage the development of talent, skill, and future leaders for the consulting engineering sector.

The Climate Change Charter was first published in November 2021.

Although the Climate Change Charter has not yet had an effect on the drafting process, future adjustments are anticipated to incorporate sustainable business practices into the standard form contract. Its commitment to tackling the climate crisis is timely and laudable. Guidance and briefings are always useful but there is a need for a standardized market approach with carbon reduction provisions. [10]

FIDIC adoption worldwide

There is at least one contract, and frequently more than one, underlying the foundations of every structure. The building of a construction site is a drawn-out and difficult process that involves a large number of participants, each of whom has their own objectives to fulfill during the course of the project. It doesn't matter what the hypothesis is; the parties with the least involvement are always an investor, a designer, a builder, and a supplier. Yet how are these partnerships governed when the persons involved are from different nations but want to work together on a business project? [11]

It is crucial to understand how widely FIDIC is used globally, as seen on the map below. It displays every nation in the globe (102 in total to date) that accepts FIDIC contracts as valid and enforceable within its borders. The names of the relevant associations and/or partners that work in these nations and promote the adoption, comprehension, and dissemination of FIDIC are also listed. The three basic types of FIDIC

Member association (member organization): This is a national organization that frequently represents a group of consulting engineering organizations in the country in question. These organizations are renowned for the caliber of their work and actively participate in important infrastructure and other construction projects both domestically and internationally.

Associate member: those businesses, associations, firms, or groups of businesses that are active in nations where FIDIC does not yet have a member organization or representative. Most often, groups aiming to become national membership organizations for the nation in question are awarded this form of membership.

Affiliate member: Whether or not there is a national FIDIC member organization in a specific nation, this category comprises any person, association, organization, corporation, or group of companies with headquarters in that nation. This form of membership is primarily intended for trade organizations that want to support FIDIC's local and international activities and keep close links with the organization. [12]

Figure 2: FIDIC Member Associations



Source: <https://fidic.org/membership>

The role of the Engineer

The development of the world's infrastructure has been largely facilitated by the engineering profession, which has also produced solutions that use engineering materials, some of which have

high embodied carbon emissions and may produce significant operational carbon emissions when used. There is considerable doubt that each of these emissions, along with those from numerous other industries, contributes to the global warming problem. This is an international issue, not just a problem for one industry. In terms of energy, water, waste, transportation, housing, and industrial assets, engineers are in a unique position to alter the effects of construction, infrastructure, and built environment emissions.

In FIDIC and the law, the engineer's function has changed from that of a third party bridging the gap between the employer and the contractor to that of the employer's agent, with varying authority depending on which FIDIC contract model the parties choose to use. The 2017 Suite of FIDIC Contracts gives the Engineer more significance by giving him a strong administrative role in maintaining the contract and by taking a clear stance in favor of his objectivity when making decisions or resolving disputes.

The "Engineer," who has a specific duty to perform throughout construction and is typically included in FIDIC contracts, is presumed to be the "different Consulting Engineer" mentioned. The "Designing Engineer" may be an engineer hired by the Employer only for the purpose of designing the Works (with the other Engineer taking over to supervise the Works during construction) or, in the case of a design-build or turnkey project, may be an engineer hired by the Contractor. In both roles, the Engineer can be a very impactful figure for the construction project and can influence the practices implemented during the design and construction.

The FIDIC Sustainable Development Group, sometimes known as "the Committee," is a working committee of FIDIC that was established by the FIDIC Board. Their primary functions are:

Determine the impact of the construction sector and provide consulting engineering with advice on how to maximize its influence on attaining the SDGs (Sustainable Development Goals) by developing strategies, tools, and training.

Assess the possible effects of climate change and provide a venue for consulting engineers to exchange ideas on how to make buildings, infrastructure, and cultural heritage more resilient, mitigated, and climate-change-ready.

Give FIDIC advice on the best sustainability policies and procedures.

The Engineering Industry has a crucial role to play in promoting, supporting, and putting the SDGs into practice on a global scale, according to FIDIC. In that regard, challenges remain and there is a need for broader international alignment on common standards and certification methodologies. [9]

5. Building materials lifecycle

Building materials and the construction industry as a whole have significant negative effects on the environment since they demand a lot of energy and resources during their manufacturing, usage, and even destruction processes. These effects of materials include ecological destruction, harm to human health, and global warming in addition to an increase in energy consumption. Prior

to the design and construction of buildings, it is essential to examine and analyze building materials in order to identify risks. Materials and engineering design techniques are just two examples of design decisions that can have a positive or negative impact on carbon emissions and the ability to adapt to climate change.

Data collection, geophysical model development, and the development of probabilistic risk-based models will be required to inform investment decision-making in order to achieve change efficiently and avoid or reduce the cost of loss and damage to buildings and infrastructure.

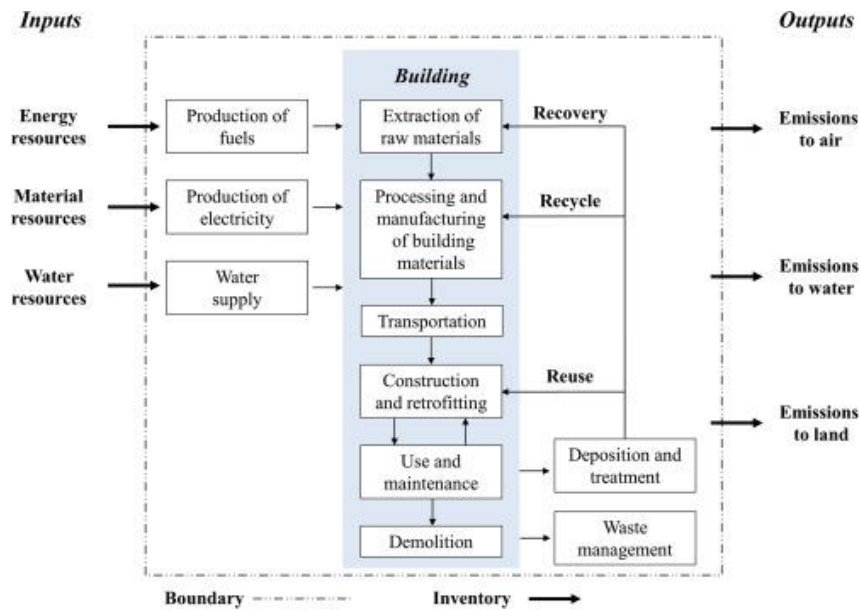
The extraction of raw materials, processing and manufacture of these raw materials, transportation, construction and retrofitting, use and maintenance, demolition and waste management, disposal, and circular processing through reuse, recycling, and recovery are all included in the full life cycle stages of building materials, also known as value chain or supply chain processes. [13]

Global building material use has increased, and this has led to significant pollution and waste emissions. The environmental costs associated with building materials arise throughout their value chain, from extraction to manufacture to post-demolition cleanup. ² The three materials that have the greatest environmental impact during production are cement, steel, and concrete. [14]

The majority of studies on mitigation strategies have focused on certain materials or phases of the value chain. Without taking the entire life cycle into account, mitigation actions for one stage of the life cycle may have additional or even negative environmental effects.

The life cycle of building materials, as represented in Figure 2, constitutes of input resources, building materials, and output emissions in different life stages. A Building starts from the extraction of the raw materials all the way to the demolition, including manufacturing, transportation, construction and maintenance. Energy and water usage, building materials, and polluting emissions.

Figure 2: Life Cycle Assessment Application Framework for Building Materials



Source: oecd.org (2021)

5. Conclusions and recommendations

It is crucial for all industry actors to comprehend their obligations, liabilities, and limitations in each document, regardless of the contracts, protocols, guidance notes, or other requirements that may be included for a certain project. The ability of FIDIC to give additional guidelines to implement the Charter and assist the sector in creating best practices that genuinely promote sustainability and strengthen the fight against climate change will be crucial for the Charter's actual impact. Upskilling industry participants to plan and design for a low-carbon future by sharing knowledge, case studies, and experiences will be critical to addressing the carbon reduction challenge.

The next stages for FIDIC might include beginning to more thoroughly incorporate environmental elements into the draft suite of contracts that FIDIC users are currently accustomed to. As always, creating environmental measures is problematic because they heavily depend on the project, the parties' goals, and international, state, and local laws and regulations. As a result, creating a template that "fits all" may not accurately reflect the complexity of the projects or the participants in them.

In addition to that, it would be extremely beneficial if FIDIC's playbook included working scenarios (similar to the excellent FIDIC Covid guidance) not only looking at how such provisions

would work in practice but also providing guidance on how to adapt FIDIC contracts to work with the most globally recognized sustainability rating obligations.

However, attention must be drawn to the significant cultural shift that the Charter implies: all stakeholders must now work toward the objective of achieving net-zero emissions by 2045 (or earlier).

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Circular economy: A brief literature review on indicators of the monitoring progress towards it

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Abstract

*Our planet is facing numerous environmental and ecological challenges with a global population projected to reach 9.8 billion in 2050 (**The World Population Prospects: The 2017 Revision**). In 2015 is adopted the 2030 Agenda for Sustainable Development having at its core the Sustainable Development Goals (SDGs). Under this framework the Circular Economy (CE) emerges as a global trend and an effective tool for a sustainable development process. In December 2015, the European Commission adopted a Circular Economy Action Plan, with global efforts on sustainable development. Part of this EU Action Plan were also the tools to monitor progress towards the circular economy, where a series of indicators was developed. This paper aims to present the different indicators and their sub-indicators in four thematic areas of circular economy: production and consumption, waste management, secondary raw materials, competitiveness and innovation. The European Commission set up a monitoring framework on circular economy, consisting in ten indicators. The paper analyzes the statistical indicators used to capture the main elements of circular economy, how they are calculated, the data used, through a literature review of the monitoring framework of circular practices across the European Union (EU) member states. In order to apply and monitor the progress of circular economy of the country, accurate and easily accessible data is needed for each sector, mainly in the sectors that are essential to the development of circular economy.*

Keywords: Circular economy, European Union, Progress of circular economy, Indicators of monitoring

Jel Code: C18, C40, C43, C80, F63, O10

Introduction

The planet is facing numerous environmental and ecological challenges with a global population projected to reach 9.8 billion in 2050 (*The World Population Prospects: The 2017 Revision*) [1]. At the 70th UN General Assembly in 2015 is adopted the 2030 Agenda for Sustainable Development having at its core the Sustainable Development Goals (SDGs). Under this framework the Circular Economy (CE) emerges as a global trend and an effective tool for a sustainable development process. According to European Union, the circular economy aims to maintain the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use, while minimizing the generation of waste. *Based on the definition of the Ellen MacArthur Foundation (2013), a circular economy is an industrial system that is restorative or regenerative by intention and design, it is based on three principles: eliminate waste and pollution, circulate products and materials, regenerate nature* [2]. All waste should become a source for another process: either a by-product or recovered resource for another industrial process or as regenerative resources for nature¹. *The economic benefit of transitioning to this new business model is estimated to be worth more than one trillion dollars in material savings* [3]. *Annual waste generation is projected to increase by 70% by 2050 (World Bank, 2018)* [4]. *According to the statistics of Eurostat in waste statistics 4.8 tonnes of waste were generated per EU inhabitant in 2020.*

The circular economy offers an opportunity to reinvent our economy, making it more sustainable and competitive. The benefits of CE include environmental benefits in terms of climate such as fewer emissions by reducing the greenhouse gas emissions, land productivity and soil health and air pollution. The economies that operate under the CE principles have economic benefits such as economic growth, employment growth by creating opportunities for local jobs and social integration, incentives for innovation in producing and consuming. Applying circular economy principles across the EU economy has the potential to increase EU GDP by an additional 0.5% by 2030 creating around 700 000² new jobs [5].

In recent years, European and international policies that aim to implement circular economy have been put in place, such as the Sustainable Development Goals, the Circular Economy Action Plan, the European Green Deal and the European Plastics Strategy. The EU Circular Economy Action Plan notes that it is impossible to achieve climate-neutrality by 2050 without transitioning to a fully circular economy. The aim of this plan is to ensures that the circular economy works for people, regions and cities, fully contributes to climate neutrality and harnesses the potential of research, innovation and digitalisation. It foresees the further development of a sound monitoring framework contributing to measuring well-being beyond GDP³ [6]. Part of the circular Economy Action Plan, in close relation with key EU policy priorities and with global efforts on sustainable development, were also the tools to monitor progress towards the circular economy.

For this purpose, a series of indicators was developed, taking the necessary steps to improve the quality of these data. This paper aims to present the different indicators and their sub-indicators in four thematic areas of circular economy: production and consumption, waste management,

secondary raw materials, competitiveness and innovation. The European Commission set up a monitoring framework on circular economy, consisting in ten indicators which are divided into the respective thematic areas of circular economy. The article analyses the statistical indicators used to capture the main elements of circular economy, how they are calculated, the data gathered, their unit measure, and their frequencies of dissemination, through a literature review of the monitoring framework of circular practices across the European Union (EU) member states.

In Albania the circular economy is in its first step of development. In 2021, the amount of recycled waste in Albania represents about 18.8% of the total amount of generated waste⁴. In 2021, about 2 % of total waste was treated with incineration for energy purposes⁴. Albania has been awarded the official candidate status for accession to the EU in 2014 and Albania to gradually has to align legislation with the EU Acquis, including the area of environment and especially waste management. In order to apply and monitor the progress of circular economy of the country, accurate and easily accessible data is needed for each sector, mainly in the sectors that are essential to the development of circular economy.

1- The Ellen MacArthur Foundation, Toward the Circular Economy, 2013,

2-Final report of European Commission Impacts of circular economy on the labour market

3- Circular Economy Action Plan. For a cleaner and more competitive Europe, European Union 2020

4- Institute of Statistics (INSTAT), Urban Solid Waste, 2021, Tirana, Albania

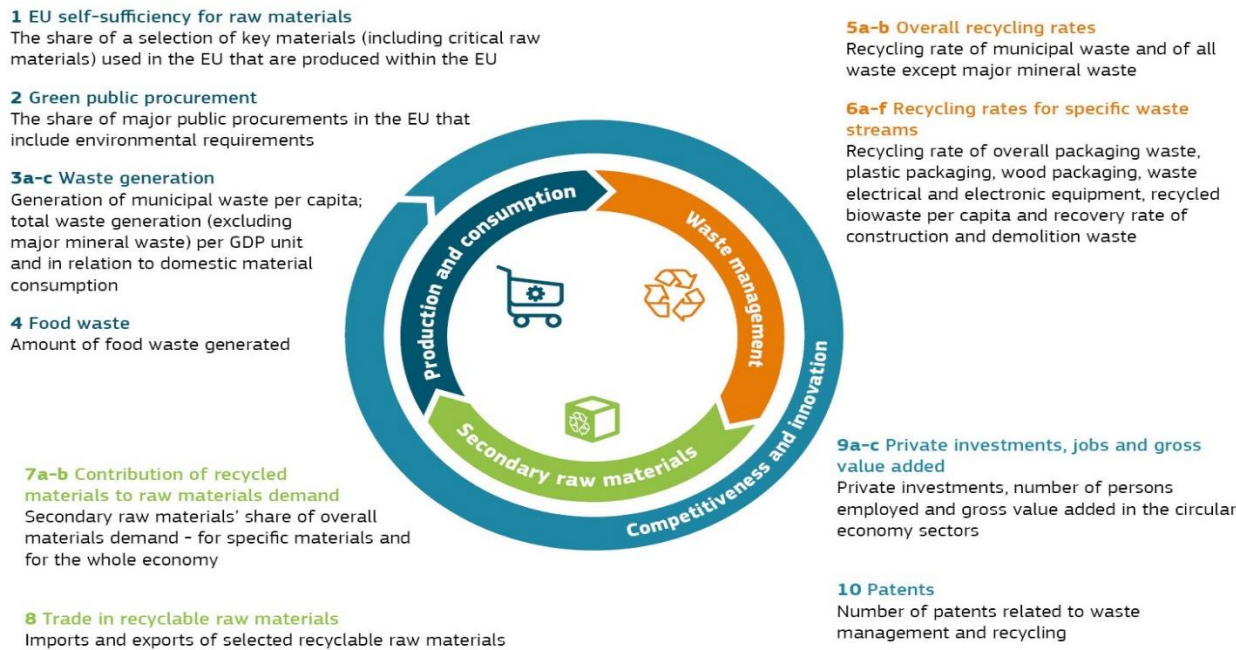
Tools and methodology

To achieve the goals proposed by this article, a qualitative study was conducted, employing a [literature review](#), using the most recent studies and relevant articles. This paper has been developed based on secondary sources of data. A thorough desk research is developed in order to put together all available international reports on circular economy and its related fields. The focus was placed on the studies that provide relevant information of policy-making processes and consider explicitly the core principles of circular economy, its implementation, monitoring frameworks and indicators of monitoring. We identified studies, documents, reports of European commission, on monitoring framework of circular economy, based on its indicators related with four thematic areas of circular economy: production and consumption, waste management, secondary raw materials and competitiveness and innovation.

Results

Action on the circular economy ties in closely with key EU policy priorities and with global efforts on sustainable development. The monitoring framework [7] on the circular economy as set up by the European Commission consists of ten indicators, divided into the following four thematic areas:

Circular economy monitoring framework



1-Production and consumption. Households and economic sectors by decreasing the amount of waste they generate, may contribute to an increasing self-sufficiency of selected raw materials for the production process.

2- Waste management. Increasing recycling is an essential part of the transition to a circular economy. This area focuses on the share of waste which is recycled and actually returned into the economic cycle to continue creating value.

3- Secondary raw materials. Recycled materials replace newly extracted natural resources, reduce the environmental footprint of production and consumption and increase the security of the future supply of raw materials.

4- Competitiveness and innovation. The circular economy has its contribution to the creation of jobs and growth. The development of innovative technologies improves product designs for easier re-use and promotes innovative industrial processes.

Figure 1. Circular economy monitoring framework:

Source: Eurostat 2022, <https://ec.europa.eu/eurostat/web/circular-economy/indicators>

These ten indicators for the fourth thematic areas are divided into sub-indicators:

1-Production and consumption comprises four indicators: -Self-sufficiency of raw materials for production in the EU; -Green public procurement, as an indicator for financing aspects; -Waste generation, as an indicator for consumption aspects; -Food waste.	
1.1.EU self-sufficiency for raw materials	The Self-sufficiency (SS) indicator measures how much the EU is independent from the rest of the world for several raw materials.

	<p>This indicator is calculated using the formula:</p> $SS = 1 - (\text{net}) \text{ Import Reliance,}$ <p>where Import Reliance (IR) :</p> $IR = \frac{\text{Import} - \text{Export}}{\text{Domestic production} + \text{Import} - \text{Export}}$ <p>The indicator is calculated using yearly data and it range from 0 to 100%.</p> <p>Frequency of dissemination is every 3+years and in 2018 it has the value 9.8%</p>
1.2. Material footprint.	<p>The indicator RMC (in tonnes per capita), as a measure of material footprints, gives insight into the quantity and type of materials required to meet the EU's demand for products. It is calculated as: (calculated at the aggregate product level, by material).</p> $RMC = RMI \text{ (Raw material input)} - RME \text{ (exports in raw material).}$ <p>Frequency of dissemination: Every year</p>
1.3 Resource productivity	<p>The indicator is defined as GDP/DMC, where GDP is the gross domestic product and DMC is domestic material consumption. DMC is defined as the annual quantity of raw materials extracted from the domestic territory of the local economy + all physical imports - all physical exports. This indicator is disseminated every year.</p> <p>This indicator is published in three different units:</p> <ul style="list-style-type: none"> - in euro per kg, chain-linked volumes (2015). - in PPS per kg. Purchasing Power Standards are fictive 'currency' units that remove differences in purchasing power, hence eliminate differences in price levels across countries. - as an index (2000=100) - based on GDP in chain-linked volumes normalized to 2010 prices, for comparing the values in different years to a previous value (year 2000).
1.4 Generation of municipal waste/capita	<p>The indicator measures the waste collected by municipal authorities. It is measured in kg per capita. For the amount of municipal waste generated, the data refer to the handover over the waste to the waste collector or to a disposal site. Frequency of dissemination is every year and in 2020 it has the value 517 kg/capita.</p>

1.5 Generation of waste excluding major mineral wastes per GDP unit	The indicator is defined as all waste generated in a country (in mass unit), excluding major mineral wastes, per GDP unit (in euro, chain linked volumes (2010)). The ratio is expressed in kg per thousand EUR. Frequency of dissemination is every two years and has the value 66 for 2020.
1.6 Generation of waste excluding major mineral wastes per domestic material consumption	The indicator is defined as all waste generated in a country (in mass unit), excluding major mineral wastes, divided by the domestic material consumption (DMC) of a country. The ratio is expressed in percent (%) as both terms are measured in the same unit, namely tonnes. The smaller the value of the ratio, the better the performance. In 2020 was 12.8%. This indicator has a frequency of dissemination every two years.
1.7 Generation of packaging waste per capita	'Packaging' in this case means all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer. It is measured in kg per capita and the frequency of dissemination is every year.
1.8 Generation of plastic waste per capita	This indicator includes plastic packaging waste. The unit of measure is Kilograms per capita and has the frequency of dissemination every year.
<p>2-Waste management comprises two indicators: -Recycling rates, the share of waste which is recycled;</p> <p>-Specific waste streams, packaging waste, biowaste, e-waste, etc.</p>	
2.1 Recycling rate of municipal waste	Recycling rate of municipal waste gives an indication of how waste from final consumers is used as a resource in the circular economy. The indicator measures the share of recycled municipal waste in the total municipal waste generation. The frequency of dissemination for this indicator is every year. In 2020 was 48.6%.
2.2 Recycling rate of all waste excluding major mineral waste	<p>The indicator (in %) reflects the treatment of national waste, no matter where it takes place, and it excludes the waste that is imported from non-EU countries.</p> <p>The indicator is calculated as recycled waste (RCV_R) divided by total waste treated excluding major mineral wastes (TRT), multiplied by 100. The amount of recycled waste is adjusted as following: waste treated in domestic plants plus waste sent out of the country for recycling minus waste imported and treated in domestic recycling plants. It is disseminated every two years. In 2020 was 53%.</p>

2.3 Recycling rate of packaging waste by type of packaging	<p>The indicator (in %) is defined as the share of recycled packaging waste in all generated packaging waste. Packaging waste covers wasted material that was used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer, excluding production residues. It is disseminated every year.</p> <p>Packaging waste is broken down into 'paper and cardboard packaging', 'plastic packaging', 'wooden packaging', 'metallic packaging' and 'glass packaging'. Recycling rate of plastic packaging waste counts exclusively material that is recycled back into plastic (material recycling / generation).</p> <p>-Recycling rate of wooden packaging waste is calculated including repair (recycling + repair of wooden packaging waste / generation + repair of wooden packaging waste).</p>
2.4 Recycling rate of e-waste	<p>Waste electrical and electronic equipment (WEEE), also known as e-waste, such as computers, televisions, fridges and mobile phones, is one the fastest growing waste streams in the EU. The indicator (in %) is calculated by multiplying the 'collection rate' as set out in the WEEE Directive with the 'reuse and recycling rate' set out in the WEEE Directive. The frequency of dissemination is every year and in 2018 the value of this indicator was 38.9%.</p>
2.5 Recycling of biowaste	<p>The indicator (in kg/capita) is indirectly measured as the ratio of composted/mechanized municipal waste (in mass unit) over the total population (in number). This indicator is important for signaling the significance of composting/anaerobic digestion as a contribution to circular economy objectives for municipal wastes. The frequency of dissemination is every year and in 2020 was 93%.</p>
2.6 Recovery rate of construction and demolition waste	<p>The indicator is the ratio of construction and demolition waste which is prepared for re-use, recycled or subject to material recovery, including through backfilling operations, divided by the construction and demolition waste treated as defined in Regulation (EC) No 2150/2002 on waste statistics.</p> <p>The indicator covers the waste category 'Mineral waste from construction and demolition' (EWC-Stat 12.1). Mineral waste from construction and demolition are for instance concrete, bricks, and gypsum waste; insulation materials; mixed construction wastes containing glass, plastics and wood; and waste hydro-carbonized road-surfacing material (legal definition is given in the EWC-Stat). It is</p>

	Measured in Percentage of construction and demolition mineral waste recycled. The frequency of dissemination is every two years and for 2020 was 89%.
3-Secondary raw materials comprise two indicators: -Contribution of recycled materials to raw materials demand; -Trade of recyclable raw materials between the EU Member States and with the rest of the world	
3.1Contribution of recycled materials to raw materials demand end of life recycling input rates	The indicator (in %) measures, for a given raw material, how much of its input into the production system comes from the recycling of "old scrap" (or "end-of-life scrap") i.e. scrap and waste derived from the treatment of products at their end-of-life (EOL). The frequency of dissemination is every three years and in 2019 was 12.3 %.
3.2Circular material use rate	<p>The indicator (in % of total material use) measures the share of material recycled and fed back into the economy. The circular material use, also known as circularity rate is defined as the ratio of the circular use of materials to the overall material use.</p> <p>The overall material use is measured by summing up the aggregate domestic material consumption (DMC) and the circular use of materials. DMC is defined in economy-wide material flow accounts. The circular use of materials is approximated by the amount of waste recycled in domestic recovery plants minus imported waste destined for recovery plus exported waste destined for recovery abroad. A higher circularity rate value means that more secondary materials substitute for primary raw materials thus reducing the environmental impacts of extracting primary material. The frequency of dissemination is every two years and in 2020 was 12.8%.</p>
3.3Trade in recyclable raw materials	The indicator (trade value in thousand euro or trade quantity in tonne) measures the quantities recyclable waste and scrap as well as other secondary raw materials (by-products) that are shipped between the EU Members States (intra-EU) and across the EU borders (extra-EU). The frequency of dissemination is every year. In 2021 imports from non-EU countries was 46 838 227 tonne, exports to non-EU countries 40568862 tonne and intra EU trade 98868774 tonne.
4-Comptitiveness and innovation. The circular economy has the potential to contribute to the creation of jobs and economic growth and this area comprises two indicators: -Private investments, jobs and gross value added; -Patents related to recycling and secondary raw materials as a proxy for innovation.	
4.1Private investments jobs and gross value	The indicator includes "Gross investment in tangible goods" defined as investment during the reference year in all tangible good,

related to circular economy sectors	<p>“Number of persons employed” as a percentage of total employment and “Value added at factor costs” which is the gross income from operating activities after adjusting for operating subsidies and indirect taxes, in the following two sectors: the recycling sector and repair and reuse sector. The frequency of dissemination is every year and the Unit of measure for this indicator are:</p> <p>-Private investments and gross value added are expressed in million euro and as a percentage of gross domestic product (GDP).</p> <p>-Jobs are expressed in number of persons employed and as a percentage of total employment.</p>
4.2 Patents related to recycling and secondary raw materials	<p>The indicator measures the number of patents related to recycling and secondary raw materials. The term 'patents' refers to patent families, which include all documents relevant to a distinct invention (e.g. applications to multiple authorities), thus preventing multiple counting. A fraction of the family is allocated to each applicant and relevant technology.</p> <p>Whereas the indicator provides insight into the most relevant innovative recycling technologies, it does not cover all technologies related to waste management, nor other services and business models of the circular economy. It also needs to be noted that not all relevant innovations are or can be patented.</p> <p>Unit of measure: -Number of patents and -Number of patents per million inhabitants.</p> <p>Frequency of dissemination is every year</p>

Source: Eurostat (<https://ec.europa.eu/eurostat/web/circular-economy/indicators/monitoring-framework>) and author elaboration .

In Albania in 2021, it turns out that around 875,105 thousand tons of urban waste have been managed. The annual amount of urban waste managed per inhabitant is 311 kg/inhabitant, The coverage level of the population with municipal waste management services was 88.8 %, 18.8 % of the total amount of waste was recycled, and about 2 % of total waste was treated with incineration for energy purposes [8].

The situation of waste management in Albania has been highlighted into the European Commission Albania report 2022, where specifically the report emphasizes that *“The legal framework for waste management is partially aligned and substantial efforts to achieve alignment are needed. Closing of non-compliant landfills and dumpsites, as well as littering, remain a significant challenge. Separate collection of waste streams and economic instruments to promote recycling, reuse and to prevent waste generation are still insufficient. The waste management policies do not aim to reach EU 2030 recycling targets. Albania should promote circular economy and should incentivize preventing, reducing and recycling waste, especially composting, to cut*

down landfilling. The implementation of the waste streams legislation should be speeded up. The enforcement and compliance-checking role of the institutions should be clarified and strengthened, with appropriate staffing and budget”.

Conclusions and recommendations

The Circular economy is an essential tool for a sustainable development process. It offers an opportunity to reinvent the economy, making it more sustainable and competitive. Recycling focuses on the share of waste which is recycled and actually returned into the economic cycle to continue creating value. Recycled materials replace newly extracted natural resources, reduce the environmental footprint of production and consumption and increase the security of the future supply of raw materials. The circular economy contributes to the creation of jobs and growth. The development of innovative technologies improves product designs for easier re-use and promotes innovative industrial processes. To monitor the progress towards the circular economy it is important to monitor all thematic areas of circular economy by using the appropriate indicators by using accurate and easily data for each sector of the circular economy. In order to apply and monitor the progress of circular economy of the country, accurate and easily accessible data is needed for each sector, mainly in the sectors that are essential to the development of circular economy.

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Modeling and prediction of average monthly consumption in the analysis of the group of buyers with Meta-Analysis.

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Abstract

This article deals with the observed changes in consumer spending in a region of Albania following the fall in market selling prices. The paper focuses on the statistical study of a local consumer system. Accordingly, in a more generalized and mathematical perspective, the generalized customer or consumer is the user and the consumer as a behavioral agent. The aim of the paper is to identify the best or most suitable model for the behavior profile according to the profile determined by the inductive analysis of the variables themselves. Meta-analysis refers to statistical analyzes of summary results from independent primary studies to decide on policies. Like many others statistical methods, heterogeneity is an important issue in meta-analysis. For this reason, part of the aim of the paper is to build the behavioral profile and the factor group profile. The most pronounced effect was then found to be associated with the primary consumer of the systematic review, highlights selected effect size measures, discusses different statistical models and illustrates meta-analyses using statistics.

Keywords: Probit model, behavior models, (REs) model w , meta-analysis

Instructions

Meta-analysis is a statistical method used to combine numerical summary results on effect size measures, extracted during the systematic review process from independent studies to synthesize a pooled result. Meta-analysis enables us to arrive at a better estimate of the population effect size compared to that reported in individual studies especially when results of independent studies are conflicting.

There are a number of statistical models that are commonly used in meta-analyses. See chapter 2 of [12] for different relevant statistical aspects of meta-analysis.

The study of concrete economic environment unavoidably face challenges to the scholars. Standard questionnaires that aims gathering information from social or economic mediums include different types of variables, non-numerical responses, questionable answers, missing or incomplete records etc. Usually the inquiries might be organized and held in different moment of times. Finally they must be included in modeling say linear multivariate functions. Consumer behavior is an opinion formation process which is difficult to be studied quantitatively and rather complex as evidenced in [1]. In a formal approach they are assumed to act rationality in their decision making by optimizing some utility function, but this last cannot be measured directly. Meanwhile the assumption of rationality does not hold always which is clarified by behavioral theories as discussed in [2], [3] etc. Behavior seems to be too complex to be studied and analyzed by deterministic methods. Even so, researchers and scholars have outdone this difficulty by using statistical tools and probabilities facilitating modeling in this case as presented in many textbooks. Aside of general models and regressions, practical calculation have demonstrated their capacities to describe consumer behavior in specific systems as in [5], [6] and many others. In our recent work [7] we applied a meta-analysis to identify the consumer profile in a specific area, the factors affecting their behavior and other parameters characterizing the system of consumer attitudes and activities. Therein we have focused our attention in the fact that the stationary of the state should be considered in the framework of advanced analysis elsewhere proposed in [8] and [9] with mathematical reviews in [10]. In reference [11] a more advanced technique have been reported dealing with complexity in the behavioral models. This study is intended to evaluate a marketing aspect as discounts for example, by specifically considering the nature of the state of the system, the possible presence of not-apparent factors as latent effects or hidden variables etc.

1.1 STATISTICAL MODELS

Different statistical models use different formula to find the study weights. In fact, the main focus of every statistical model is to re-distribute the weights appropriately in the meta-analysis. The main objective of re-distribution of weights is to find the most precise estimate.

If the studies are not heterogeneous the fixed effect model is fine. Unfortunately, in real-life most of the studies are heterogeneous and hence fixed effect model is not appropriate. As part of the process test of heterogeneity is essential. This is done by using Cochran's Q statistics which follows a Chi-squared distribution. If the test outcome is significant the fixed effect model is inappropriate and meta-analysis requires appropriate statistical model.

Every meta-analysis assumes that there is a common effect across all studies, and pulls data from all studies to estimate the unknown common effect size, usually denoted by Θ using an appropriate statistical model.

1.2 Relaxation of the distribution after sales

We start from the inspecting statistical behavior of the system by analyzing the distribution for characteristic variables, and we observe that among many candidates the q-Gaussian mentioned before in our work and introduced by [8] ,[10] etc

$$p(x) = \alpha \left[(1 - \beta(1-q)(-\mu))^2 \right]^{\frac{1}{1-q}} \quad (1)$$

fits the data better than other tested. In addition and to count for mixed multiplicative properties as usually expected for complex dynamics, we use q-lognormal as detailed theoretically in the reference [10]

$$p(x) = \alpha \frac{1}{x^q} \left[\left(1 - \beta(1-q) \left(\left(\frac{x^{1-q} - 1}{1-q} \right)^{1-q} - \mu \right) \right)^2 \right]^{\frac{1}{1-q}} \quad (2)$$

Q-distribution have been successfully used in and suggested in the studies for complex systems as generalized in the reference [10] and applied in [9] etc. Remember that q-additive and q-multiplicative process responsible for q-Gaussian and q-lognormal respectively, are defined by q-algebra as follows

$$a \oplus_q b = \begin{cases} a + b + (1-q)ab & a, b > 0 \\ 0 & a, b \leq 0 \end{cases} \quad (3)$$

$$a \otimes_q b = \begin{cases} [a^{1-q} + b^{1-q} - 1]^{\frac{1}{1-q}} & a, b > 0 \\ 0 & a, b \leq 0 \end{cases}$$

that clearly shows the q parameter is the measure of the distance from pure processes. If in (5) we denote a,b,c.. the probability for separate events, the probability of their occurrence becomes quite complicated as really happen in reality. If a process has two types of interactions say the additive and multiplicative properties, the distribution characterizing the state is more likely to be a q-Gaussian [6]. A q-lognormal will be considered if logarithm of variable is considered but the original equation in 5 does not shows directly the expected q-multiplicative behavior. Moreover the q-lognormal is a stable attractor only for q=1, therefore functions of type (3) are very sensitive toward q-parameter. For a correct use of such analysis we implement a careful bin optimization as described in [16]. After this short briefing with q-distribution applied, we expect identified the characteristic observables for the responses of consumer in the system.

Here we selected for preliminary analysis the number of consumers visits in the market and the average purchasing expenses. The number of visits is very important for the statistics because it report the overall reaction of the consumers without being limited form the budget constraints. The distribution of the expenses is by nature the most important econometric parameter. The average and the variance for parameters are measurable if the distribution is stationary so we can perform statistical analysis in stationary states or in those states where variance is finite. According to [8] this would happen when q-Gaussian parameter is $q > 5/3$. In [10] the full alternative approach called q-Central Limit Theorem stated rigoristy of Next, we would like to know the attracting property of marketing activity which can be measured by the number of visits; therefore both cases have been analyzed form the stability point of view.

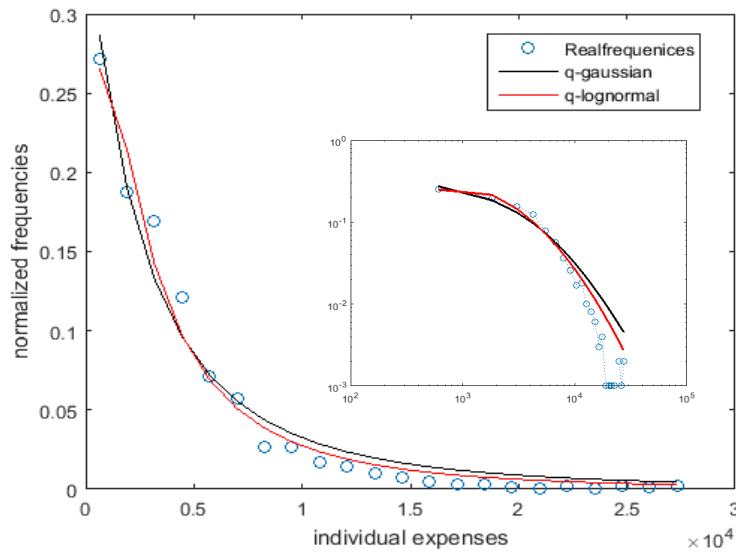


Figure 1: Distribution of visits average expenses. Normal trading period. Small picture shows log-log representation to better picture of the fit.

After realizing the fit to some expected common distributions, we observe that the parametric q -distribution had best statistics of fitting. The fitted curves are mostly q -lognormal within $\alpha=0.05$ restriction, whereas q -Gaussian has lower statistics, but is much less sensitive to the binning assize. Accepting functions of the type (2) as best fitted distributions, one can admit that the processes underlying the expenditures dynamics are q -multiplicative, hence very complicated. From the fitted q -lognormal we obtained the parameter $q=1.0001$ which report a nearly stationary lognormal if multiplicative processes are determinant. In particular it does not give the opportunity to measure the level of non-stationary as the difference $q-1=0.0001$ is too small. But in first equation of (3) we see that q -addition involve additive and multiplicative property, so for mixed processes it seems to be more significant. For this reason we prefer q -Gaussian for analysis of such behavior. Parameters q and adjusted R- Squared are [1.6531 0.9661] for q -Gaussian and [1.0001 0.9742] for the q -lognormal fitted. Therefore q -Gaussian tells that $q \sim 5/3$ that is in the boundary of definition for variances

$$\sigma_q = \frac{1}{(5-3q)\beta} \quad (4)$$

Next we considered the data for market visits and average expenditures after sales were applied. We obtain that the expenditure's distribution were found in a more stable states. The statistics for q -distributions fitted to the frequencies of consumer visits at the market again support the q -lognormal as best fitted function, but again by changing bin size we observe that q parameter in q -Gaussian changed only slowly whereas for q -lognormal it jumps from the value 1 with high margin. Therefore we consider q -Gaussians for further analysis. Q -Parameters estimated and R^2 for this case are found [1.6525 0.9778] for q -Gaussian and [1.0000 0.9974] for q -lognormal. We see that the stationary parameter q is nearly the same for the two series (before and after sales) but

as we explained above the observation time for the second is much lower. So we accept that the state after discounts is more stable .

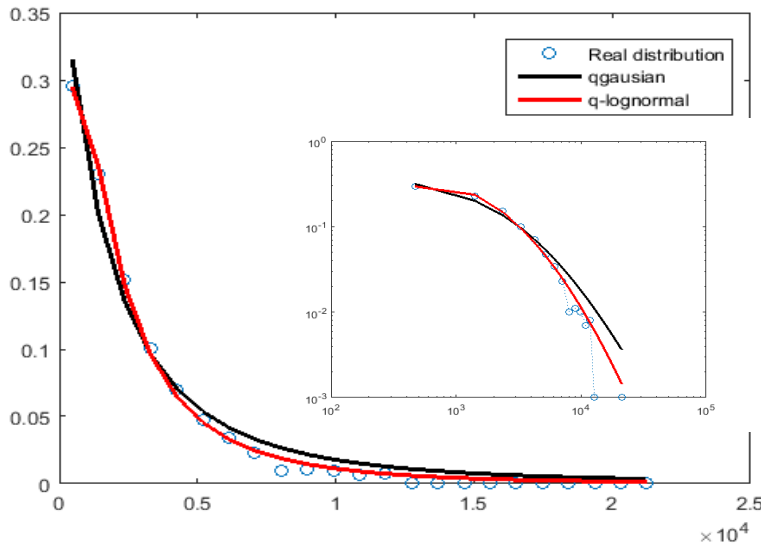


Figure 2: Distribution of average expenses (per visit) after trade discount announced.

We observe that announcing price discounts cause the number of visits to be higher and more averaged, that impose a more relaxed state which in turn could be related to a more stationary behavior or more common, typical consumer activities. In this sense we can this state for statistical analysis of the market, estimation of the representative values for expenditures and forecasting. We can simulate scenarios e.g., arrival of individuals with given set of properties using the distribution found here as PDF of the values for quantities discussed here.

1.3 The Inverse Variance Heterogeneity Model

The study of concrete economic environment unavoidably face challenges to the scholars. Standard questionnaires that aims gathering information from social or economic mediums include different types of variables, non-numerical responses, questionable answers, missing or incomplete records etc. Usually the inquiries might be organized and held in different moment of times. Finally they must be included in modeling say linear multivariate functions

$$\begin{aligned}
 Y &= A * X + \varepsilon; & (a) \\
 Y &= W * Z + u \equiv W * (\Gamma * X + v) + u & (b)
 \end{aligned}
 \tag{5}$$

or in the logistic type relationship

$$f(z) = \frac{1}{1 + \exp\left(-\alpha + \sum_{i=1}^n \beta_i x_i\right)} \quad (6)$$

where X , are factor variables or predictors and Y are responses variable or indicators whereas u, v, ε are errors and A, W, Γ etc are matrices. Versions (5).(a) are the simplest relationship in the models. In the cases (5) a regression procedure leads to the calculation of the matrices of coefficients which explain the weight of each variable (i) in responses (j). In the case of (5).(b) the problem includes the calculation of the so called latent variable (Z) adding to the coefficients matrices W and Γ . The belongs to structural equation or SEM systems, discussed in [6] , [7] and used largely in sociology [10], econometrics [11], explanatory medicine etc. In all those cases, some necessary statistical assumption should be fulfilled. It happen that in real systems many of them does not hold. Therefore quantitative methods needs for more analysis as seen in the reference [9] and others related to this aspects. In this case, some approximate methods are suggested and elaborated as in [10] or in a more dedicated case in time series in [12]. However, in general it depends on the concrete properties of the data series. In general, preparatory analysis or data elaboration is needed. The second problem is related to the tangible set of the variables included in the models. Again, standard models belong to the standard systems and in real ones there is a considerable difference. But by carefully using simple analytic tools it is possible to avoid the complexity of the model, to control extra errors added during calculation phase and improve overall calculation. In our recent research in the analysis of consumer behavior in district of Vlora, we considered such specifics as an important step [1], [2] etc. The last issue that can affect directly the quality of the modeling is the represent able property of the data gathered from measurement related to the sampling process. In practice an appropriate size of the sample might not be accessible [3] or it is difficult to be stated. For numerical continuous and normally distributed random variable, the working formula is

$$n = Z_{\frac{\alpha}{2}}^2 \frac{p(1-p)}{M \text{ arg in of Error}} = \frac{z^2 p(1-p)}{e^2} \frac{1}{1 + \frac{z^2 p(1-p)}{e^2 N}} \quad (7)$$

where z is the normalized variable $z = \frac{x - \langle x \rangle}{\sigma(\langle x \rangle)}$, Z is the critical value or level α , N is the population size and e is the level of tolerance adapted and p is the sample proportion. But it is difficult to be estimated if we consider categorical variables. In this case we proposed to choose a sample size according to numerical variables and accordingly to use auxiliary statistical tools to identify the error injected in the system by such approach. Next consider that in theoretical approaches one assumes stationary for the system states, homogeneity, formal relationship etc. Detailed analysis on those aspects are provided in many articles-guides and statistical books as [3] or [4]. In this case the problems could be overcomes if we adjusted correctly the sample size or adopt a suitable sampling method. In the case where the above step is not suitable or even impossible, the factorial and descriptive analyses could be used as recommended in standard procedures to manage the sampling error, [5] and general consideration [13]

The data set of our study consists in some general properties of buyers (consumers) that are expected to affect the response behavior which consists in the way (s)he does his expenses. They looks like the shortened Table 1 By first approach we realized the measurement by using standard models and methods over education, family size, gender, employment state etc., that are factor variables whereas quantities of expenses for specific items are response variables. Initially the formula (5), (6) were adapted and applied using those data as pilot modeling. The results were unsatisfactory. Logistic model 1.2 doesn't worked at all if using response variables as taken from the system. formula 1.2 looks unable to make a relationship between some conditions of the buyer and his expense in goods (i). To check if the model fails or variables were un-appropriate we explored the results of the logistic model (6) by removing randomly individuals in the sampling data and next liming the model in different categories of expenses. It resulted that by changing individuals, the outcome of the model does not changes abruptly whereas by referring different expenses (y) the model 1.2 gave contradictory results. Next we observe that the distributions of values of expenses (y) were highly irregular and no shape was unidentified, contrary, the relative values if the expenses showed smooth distribution.

Table 2: Variables of the model

General Information: factor variables		Expenses: Response variables			Complementary data	
Family type	Education	Other variables	Foods [Lek/monthly]	Other Expenses in the monthly bounded	Relationship with household head	Other properties
2	Professional/College;	..	60000	5000	Head of family	...
3	University	...	50000	30000

To normalize this, we proposed to use statistical counterpart of some response variables introducing the relative weight of particular expenses.

$$X \rightarrow \frac{X_i}{\sum_{i=1}^{NumberVariables} X_i} \equiv \frac{Specified_Expense}{Total_Expenses}$$

Secondly we tried to obtain the most stationary variable in y. It resulted that the grouped expenses showed more stable distributions in the bases of analysis [9]. Usually the stationary of the distribution is related to the stationary of the state and statistically we can use each on in the same

context. In [10] it has been proposed a very interesting functional form that report directly the stationary of the distribution by the parameter q:

$$p(x) = \frac{1}{Z} [(1 + \beta(1-q)(x - \mu)^2)]^{\frac{1}{1-q}} = \frac{1}{Z} \left[1 + \frac{(1-q)}{5-3q} \left(\frac{x-\mu}{\sigma} \right)^2 \right]^{\frac{1}{1-q}} \tag{8}$$

q-Gaussians are in stationary state if $1 \leq q \leq \frac{5}{3}$ and converge to the Gaussians if $q \rightarrow 1$ as detailed in [9]. In fact we observe that among many candidates the q-Gaussian and lognormal distribution fits the data better than other distributions tested. In addition and to count for mixed multiplicative properties as usually expected for complex dynamics, we use q-lognormal as detailed theoretically in the reference [4]

$$p(x) = \alpha \frac{1}{x^q} \left[\left(1 - \beta(1-q) \left(\left(\frac{x^{1-q} - 1}{1-q} \right)^{1-q} - \mu \right) \right) \right]^{\frac{1}{1-q}} \tag{9}$$

The distribution should be identified by a fully optimization procedure. The key element in picturing distribution is the optimization of the bin size based on Fredman-Diaconinis algorithm. In Figure 1 ., the near to power law distribution for expenses in alcoholic drinks for example tagged it as an un-appropriate variable. Grouping them in four expenses type respectively {basic-vital, necessary, quality-life luxury} expenses resulted in variables with stationary distribution identified in their q partner below 5/3.

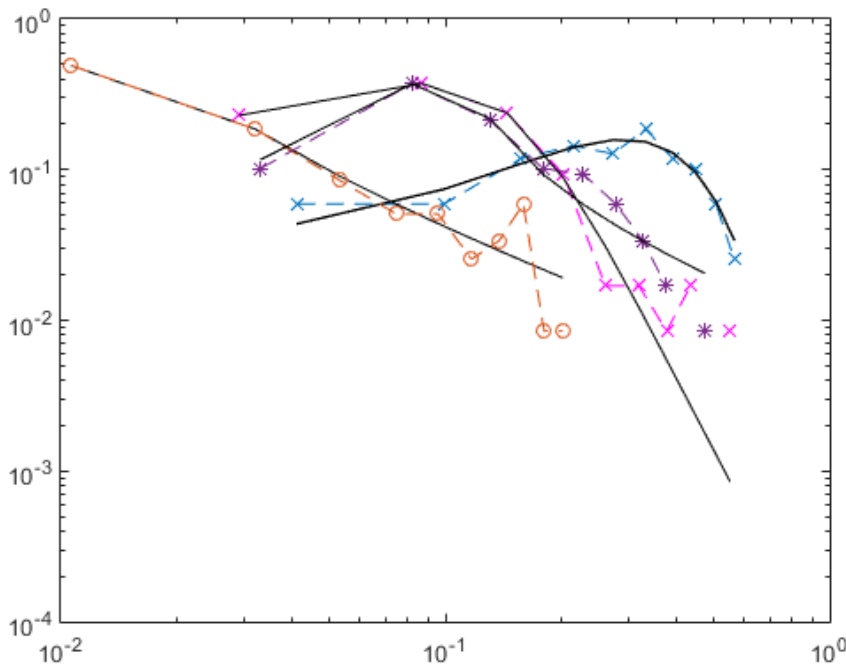


Figure 3: Logarithmic view of distributions for some variables .

Table 2: Logarithmic view of distributions for some variables

Variable		Q-Parameter	Mean	R2	Stationary : Q<5/3
Foods And Non-Alcoholic	P6	2.3193	0.1727	0.9817	FALSE
Alcoholic Ad Cigarettes	P7	2.9968	0.0582	0.9218	FALSE
Clothes	P8	1.9457	0.0884	0.9941	FALSE
Subsistence	P9	1.4498	0.062	0.9992	TRUE
Health	P 10	1.646	0.0069	0.9999	TRUE
Transport	P11	1.9654	0.0169	0.9982	FALSE
Communication	P12	2.1387	0.0932	0.999	FALSE
Entrainments And Child Care	P13	1.7068	0.0207	0.9989	FALSE
Education	P 14	2.3654	0	0.9942	FALSE
Luxury	P 15	1.7264	0.0208	0.9986	FALSE
Services	P 16	2.6702	0.0452	0.9996	FALSE
All Expenses		1.6707	0.1283	0.9987	FALSE

Obtaining Meaningfulness of Variable Type and Units

It resulted that for all response variables relative counterparts were characterized by smooth distribution, Table 2. For predictor variables we adopted a descriptive approach by classifying direct values in categories.

Table 3: Direct value classification variables

Predictor Variables		Value	
Variable	Type	set I	Set II
Family type	categorical	1-5	1-5
Education level	categorical	1-5	1-6
Age	categorical	1-6	1-4

Employment Status	categorical	1-3	1-2
Income Type	categorical	1-3	1-9
Gender	categorical	1-2	1-2
Total Consumer Budgeted	numerical	Real Value	Real Value
Initially variable. Value Real/Proportion. Categorical value 1-5	Representative variables. Real/Proportional	Proposed Variable. Real/Proportional	categorical Value :1/0
Expenses for:			
alimentary goods	Basic expenditure	Common expenditure	Is dominant: 1/0
clothes			
subsistence			
Alcoholic drinks and cigarettes			
health*	Extra expenditures	Quality life and luxuryexpenditures	Is dominant
Transport			
Communication (mob Phone calls)			
Culture and safety expenses	Qualitative Life Expenditure		
Education			
auxiliary services	Luxury_Expenditure		
Family expenses			
luxury goods			
Restaurant_Expenses			

We asked for variables to be appropriate for modeling in logistic, MIMIC and other form if they were found in a stationary state. We managed the measurement realized in the sample where an individual appears as a list of records of different type and different meaning. To include all of them in an deterministic model we must unify their measurement method. Hence categorical variables were transformed using z-score method in continuous variables. $x \rightarrow \frac{x - \langle x \rangle}{\sigma(x)}$. In another step we produced new variable binary by using levels of expenses.

$$ExpencesLevel \leftrightarrow R_i \equiv \frac{Expence_i}{Total_Expences} : Y(R_i) = \begin{cases} 1, R_i > 0.5 \\ 0, R_i < 0.5 \end{cases}$$

This last is suitable for logistic and probit modeling

Factor analysis used in fixing model variables

We applied factorial and confirmatory analysis in building logistic and probit model. To define the correct number of variables we performed PCA analyses and identified the number of variables that should be invoked in the modeling logistic or probit. By estimation the variance explained we were able to identify the size of the most important set of variables. It resulted that 5 variables could explain more than 95% of the variance. It follows that

The system of initially 12 variables resulted reducible

Usually 4 groups of expenses are enough to describe the Costumer Behavior

$$ConsumerBehaviour \leftrightarrow \begin{pmatrix} BasicExpences \\ Ordinary_Substistance_Expences \\ Life-Qualtiy_Expences \\ Luxuary_Expences \end{pmatrix}$$

In table 3 we show parameter of linear equation $LV \sim Parameters * Factors$

Table 4: Parameters of hidden variables

Factors	Parameter Matrix A			Parameter Matrix B	
	Two HV	One H.V	Observed		1 HV-Mode
Free parameter	0.0046	0.526	0.0046	SpendingAfterSales	-7.9368
Gender	1.0743	1.3994	1.0743	VisitsAftersales	141.482
AgeGroup	-0.2782	83.5887	-0.2782		
AverageVisits	-1.8217	-3.5924	-1.8217		
Average Spending	-0.3789	-0.4879	-0.3789		
RegularClient	0.0363	0.1666	0.0363		
TelephoneContact	141.482	0.0798	141.482		

Interestingly, the factors have different effects on average spending after sales and average visits. As seen in the Table 4, the parameters remain unchanged (up to 3 digits) in modeling with one and two hidden variable and therefore we restrict the model with one single hidden or latent variable. In this case the hidden variable could act as an interconnection between causes and outcomes. The reduction in the number of latent variables is plausible for the model because in this case we can use the utility as the intermediate variable ore stage in the consumer decision making. So far, we assume that the overall decision of the consumer to increase the expenses after discounts have been applied could be interpreted by a continues utility function

$$u_j = \beta_0 + \sum_{i=1}^n \beta_i x_{i,j} \quad (10)$$

where j is the individual observation and i are variables. The response will be a dichotomous as follows

$$P(Y = y_i | X) = P(a_{i-1} \leq u < a_i | X) \quad (11)$$

and for our binary output there is only one point to be considered say the moment where the continuous probability take the value 0.5.

Firstly we consider the attractiveness of the discounts, so we examine increasing number of market visits after discounts were applied. Here we use chose as dependent variables the positive change in the average number of visits after discount; and for independent factors the gender of buyer, the age group and contacts by calls to announce the offers. By applying probit regression we observe that a good fit is obtained and the marginal errors are normally distributed as seen in the figure (3). The coefficients have been confirmed as different from zero within 90% confidence, whereas the free coefficient seems to not pass the test

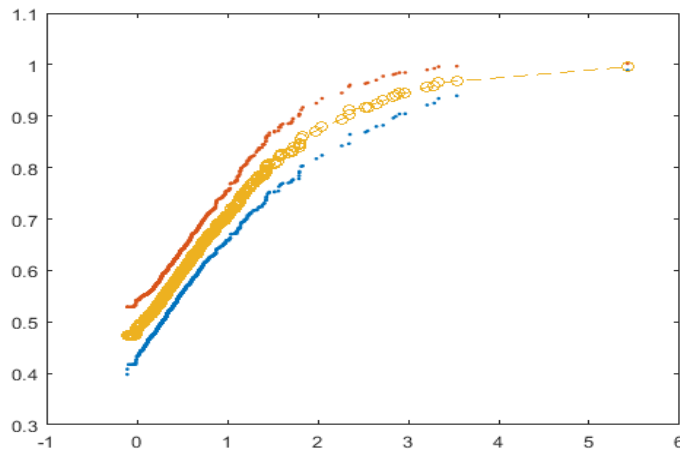


Figure 3: Probit regression for Increasing Expenditures after discounts

Therefore the utility of the attractiveness is obtained by probit regression as follows

$$Y^* = \{0.0698\} - 0.1367 * \text{GenderBuyer} + 0.0962 * \text{AgeGroup} + 0.0002 * \text{PhoneContact} + \varepsilon$$

From relation we observe that the gender of buyers ($F=1, M=2$) is mostly decisive in the increasing number of visits in the market after sales, and usually male buyers are not more frequent in the market after discounts have been applied. The phone contact has a slight effect on it. The age group has comparable role to the gender of consumer. In Figure 4 is seen that the probability for more visits in the market is high for almost all the values of utility function and only few values are less than 0.5. In this sense, for nearly all consumers' specifics, the marketing strategy (prices discounts) has been found attractive for peoples that respond by increasing the number visits in the market. Thus is the intermediate change on the consumer behavior. In the second stage, the final behavior is considered.

Conclusions

This paper presents and discusses commonly used statistical models for meta-analysis. It also compares the advantages and disadvantages of the models. The study reveals that the IVhet model provides the best option to meta-analyse the heterogeneous data. We have realized an integrated analysis for consumer reaction toward marketing tactics and strategies which could be generalized methodically for larger area. We observe that "the state" of average expenses become more stationary after the discounts have been applied. Therefore, analyses of the market, measurements of quantities and statistical study for this system should be better performed on the after-discounts states. Particularly we conclude that the consumer reaction to the discounts was characterized by the increase of spending itself, not only the volumes of items purchased. We identified the load of each factor in the increase of expenditures and acknowledge the utility form in this case. The meta-analyses of the above data set are conducted using three commonly used statistical models – FE, REs and IVhet models and the results are compared

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Assessing the Potential of Digitization in Business Transformation

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Abstract

Digitization is more than just the acquisition of new IT equipment and systems. Openness to digital business transformation is essential to keep businesses competitiveness. The digital transformation of enterprises requires not only the implementation of digital technologies, but also cross-cutting organizational changes, a movement in corporate culture and business models. The digital part of business transformation involves the transition from existing traditional systems to more efficient digital systems, thus improving several indicators of production, supply and other business functions such as increasing performance, cutting production and delivery cycles, increasing product quality and eliminating defectiveness, reducing waste, optimizing operating costs and more efficient supply chain management. The digital transformation varies depending on the specific requirements of each business entity and changes not only the way of operation the enterprises, but also the customer behavior. Based on the above knowledge, the main goal of the article is to identify the possibilities of assessing the potential of digital technologies in business transformation and based on the identification to design composite indicators to measure the extent of the digital economy and the potential of digital transformation in businesses.

Keywords: Digitization, Digital transformation, Enterprise, Improvement, Composite indicator

Jel Code: M29, O12, O39,

Introduction

Nowadays companies operate in highly competitive environment, which forces them to improve their processes. Digitization does not have just one definition; we can define it as a process of modernizing companies using recent technologies in order to give a better value for a customer. Robotization, automatization, using cloud, innovation are ways how a company can strengthen its position on the market via digital transformation. Even if the process requires higher input investment, this process has a strong potential to lower the costs in the future. In the first part of the article we will look at a literature review and background of the problematics. We will look at the Five forces model and a modern point of view on this model. In the second part we will define objectives of the paper which can help a company to measure its level of digitization and based on

the results, the company will have an overview of the general level of digitization on the market. An important part of the digitization is an environmental aspect. Companies are supposed to use a lean and green framework that took environmental and social factors into account. Due to the fact that sustainability is an increasingly used term, companies must considerate it in their process of digital transformation.

Literature review

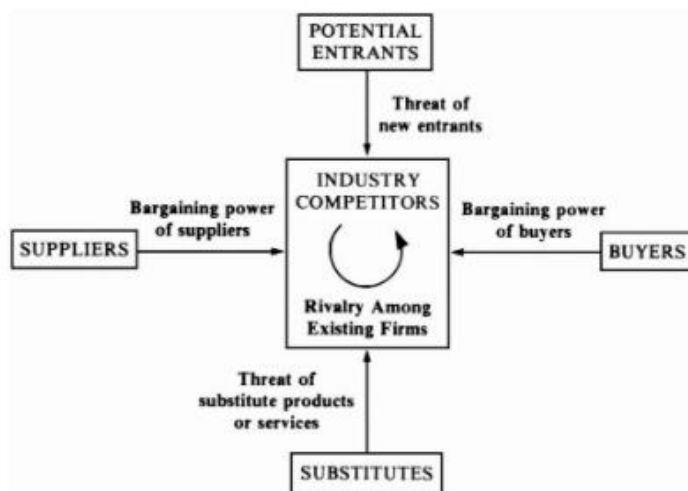
The emergence of digital agriculture may be the most revolutionary and disruptive force in business since it will profoundly alter not only how farmers run their farms but also the entire agri-food value chain. Digital agriculture will influence farmer behavior as well as how input suppliers, processing businesses, and retail businesses market, price, and sell their goods. It is applicable to all facets of agri-food systems and represents a shift away from generalist resource management toward highly optimized, customized, intelligent, and anticipatory management that is driven by data in real time (Trendov et al., 2018). Sustainable development depends on the dynamics of invention; therefore, innovation systems, green entrepreneurship, and the institutional framework of economic policy are key. The development of resource-conserving technologies and advances in energy efficiency are major obstacles. The latter alludes to the issue of global warming. There is little doubt that such an issue even exists. The global mean temperature rose between 1880 and 2010, and greenhouse gas emissions were a factor (Welfens et al., 2016). Digital technology change how we must perceive competition. Our industry's competitors aren't the only ones we have to contend with; businesses outside our sector are also vying for clients with their innovative digital services. It's possible that we'll find ourselves furiously competing with a long-time rival in one area of our business while collaborating with that firm in another to benefit from its resources. Our competitive assets may increasingly not be found within our own company but rather in a network of partners that we connect through more informal commercial ties. Perhaps the most significant way that digital technologies have altered our world is how we view data (Rogers, 2016). Numerous definitions frequently concentrate on features like content, video, mobile, interaction, size, and ubiquity, or on what digital does rather than what it is. But the most straightforward way to describe digital is in terms of binary code (ones and zeros). a non-analog means of transferring information from one location to another. In some ways, this helps us move past the notion that digital is an enigmatic, amorphous, constantly changing thing that is impossible to understand and instead frames it in terms of taking common needs, wants, and activities and meeting them or putting them to use in novel ways. Digital technologies are drastically changing consumer behavior and completely reinventing markets, but that does not mean we should ignore these changes (Perkin & Abraham, 2017). Numerous analysts emphasize and some even link consumer experiences with digital business. Organizations are told to create customer journey maps that outline the whole customer experiences as they currently stand, then analyze the effects of digital channels and capabilities, and finally incorporate the effects of new technologies on analog (physical) channels. It is unquestionably a good idea to begin by defining a digital business and digital transformation via the perspective of the client (Sacolick, 2017). Automation and miniaturization are made possible by technology, which lowers product prices and enables

businesses to target new emerging markets. The impoverished, once regarded as a "non-market," now have access to more affordable and straightforward products because too disruptive breakthroughs across industries (Kartajaya et al., 2016). In addition to the necessity of strategy as a single, inter-dependent process, Ionescu's observation focuses more than anything on two performance dimensions: agility and synchronizing the internal rate of change with the external rate. These performance dimensions are essential to success in these early stages of the fourth industrial revolution. A flexible, innovative business that is also highly strategic and customer-focused can innovate, generate transformational change, and be flexible (Wiraeus & Creelman, 2018).

To promote relevance and hence adoption, one significant trend in innovation policy is to improve the effects of public expenditure and make the system more cooperative and demand driven. In most countries, however, top-down approaches continue to be dominant. Efforts to improve the organization of the agricultural innovation system are centered on building more coherent and long-term strategies for food and agriculture innovation, explicitly incorporating stakeholders earlier in the process, and enhancing assessment frameworks ("OECD Food and Agricultural Reviews," 2019). The use of agricultural innovation systems to understand and encourage agricultural innovation has become increasingly common. Concerns about how to manage future food security and sustainability without jeopardizing food safety have grown in recent years. Agricultural innovation systems play a critical role in realizing future food systems (AIS). The networks of actors from research, business, civil society, and government that co-produce the suite of technological, social, and institutional innovations that co-shape these future food systems are referred to as an AIS (Klerkx & Begemann, 2020). Digital is a process changer rather than only a new sort of media. Due to digital technology, every procedure that affects relationships, transactions, or communication could change. Businesses must deal with a variety of transformational forces that could all have an impact on the operations. It should be understood that digital transformation is a topic and an activity that is not exclusive to a single division or stakeholder. Many employees will try to avoid it by claiming that they don't have time for digital. However, the truth is that it will have an effect on everyone. Because of this, the strategic importance of digital transformation should be elevated (Caudron & Peteghem, 2018). Industry 4.0 has received a lot of interest recently from both service systems and manufacturing businesses. However, there is no agreed-upon definition of Industry 4.0, and thus, no agreed-upon way of using emerging technologies to start the transition of Industry 4.0. In order to develop value-added networks, Industry 4.0 primarily entails the integration of manufacturing facilities, supply chains, and service systems. For a successful adaptation, a Conceptual Framework for Industry 4.0 technologies like big data analytics, autonomous (adaptive) robots, cyber-physical infrastructure, simulation, horizontal and vertical integration, Industrial Internet, cloud systems, additive manufacturing, and augmented reality must be developed (Ustundag & Cevikcan, 2017). Internet and Web technologies have created the possibility to create new business models. Typically, there are three main types of Web business models: business-to-consumer (B2C), business-to-business (B2B) and consumer-to-consumer (C2C). Websites following B2C and B2B business models typically sell goods and services and/or provide information to help users research and make purchase decisions. C2C models allow customers to interact with each other, and they involve C2C information or goods and services exchange. As Michael Rappa says, "in the most basic sense, a

business model is the method of doing business by which a company can sustain itself – that is, generate revenue” (Lubián & Esteves, 2017). Innovation and invention are frequently confused. Beyond creation and ideation, innovation exists. Making things happen and matching offers with wants are both aspects of innovation. The speed and dynamics have changed naturally as a result of the modern, dynamic societal, technological, and economic environment, so we also need to take a fresh look at the roles of the stakeholders who are creating the new markets, i.e., the new value propositions based on shared values in a different way than before. The classic science-based linear models of innovation have given way to more intricate ones incorporating stakeholders and several fields (Curley & Salmelin, 2018). Many organizations involved in science and technology create for a while, successfully use such inventions to advance their industries or fields of study, then go stagnant. If they are used effectively and assiduously, established management principles can support an organization's leaders in maintaining innovation and even reversing a slump. This section discusses some of these ideas as well as the pertinent tools and approaches that could aid business leaders in making sure their organizations stay market leaders (Trott, 2016).

Figure 1: Forces Driving Industry Competition



Source: Porter (2008)

Corporate strategists have long utilized the Five Forces Model to consider the laws of competition as well as the headwinds and tailwinds that are created while a firm runs and produces goods or services in this external environmental context. Each of these traditional drivers is being impacted by digital business, which is essentially leveling the playing field so that new entrants can enter with much less obstacles to entry. In fact, just by having a digitally oriented business strategy, these new companies may very well have a competitive advantage over rivals, even from day one. Without a question, the nature of competition is changing as a result of digital commerce. Today,

you need to be concerned about new competitors from outside your industry that have innovative digitally based business models and value propositions as well (Evans 2017).

Table 1: New digital threats impacting the Five Forces Model

Traditional force	New digital threat	Rationale
The entry of new competitors	New entrants from outside your industry, equipped with new digitally based business models and value propositions.	Digital business changes the rules by lowering the traditional barriers to entry. A digitally based business model requires far less capital and can bring large economies of scale.
The threat of substitutes	Purely digital substitutes, hybrid digital/physical substitutes and digital services wrapped around a physical product.	Switching costs are low and buyer propensity to substitute is high.
The bargaining power of buyers	Bargaining power lays out a new set of expectations for the digital customer experience and is the biggest driver of digital business.	Instant access to information as well as insights from social media. Access to substitute products and services with grater ease of use and convenience.
The bargaining power of suppliers	Suppliers can accelerate or slow down the adoption of a digitally based business model, based upon how it impacts their own situation.	Use of APIs within digital ecosystem can streamline ability to form new partnership and manage existing ones. Bargaining power can also slow down or dispute the validity or legality od the new digital model.
The rivalry among existing competitors	Entry and exit barriers are going down due to the comparative low cost of digital business models.	New entrants do not even need to own physical assets of infrastructure. The “platform” model is seeing success by connecting stakeholders and providing services that enhance the customer experience.

Source: Evans (2017)

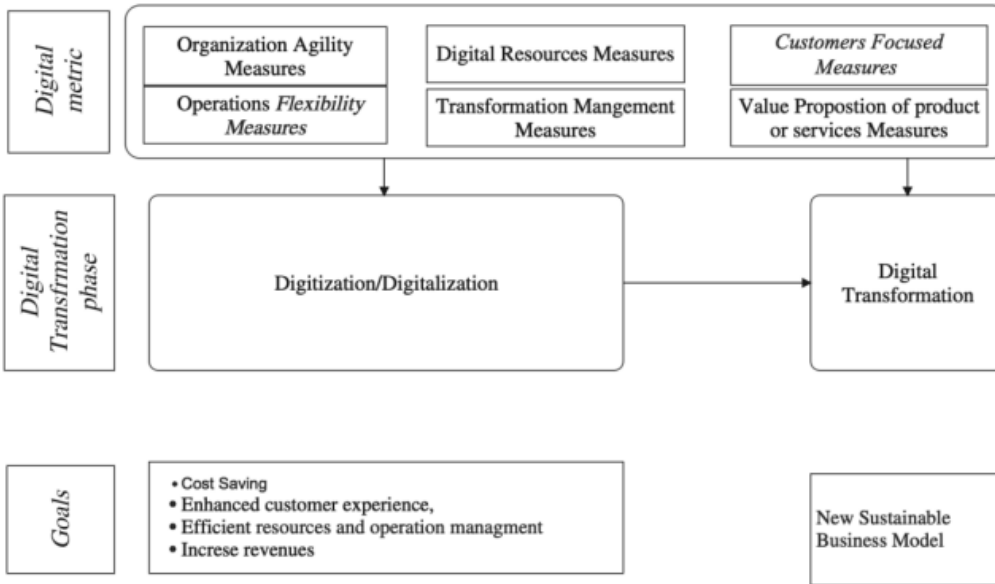
Tools and methodology

Objective of the article is to identify the possibilities of assessing the potential of digital technologies in business transformation and based on the identification to design composite indicators to measure the extent of the digital economy and the potential of digital transformation in businesses.

In the article will be introduced methods for data analysis which will be focused on collection of appropriate data, its calculation and further processing. We will process data obtained mainly from an agricultural company that has already implemented some kind of innovative technology to measure its impact. Data will be obtained from following sources: company's internal data, OECD, FAO, and Statistical Office of the Slovak Republic. Obtained data will be processed by using statistical methods which will be chosen according to the type of data. We will focus on composite indicators for measuring digitization.

Any firm that seeks to keep competitive in the global market must incorporate environmental and social factors. Previously, researchers used the Lean Six Sigma framework to improve the organization's sustainability and presented a lean and green framework that took environmental and social factors into account (Parmar & Desai, 2020). Nowadays there are many events influencing the situation of food production either worldwide or locally. Changes in the field of politics, the geopolitical situation, health issues and overall change on the market have influenced the level of production and price of agricultural products. To gather specific data about the organization and its performance, the types of measures used in each phase of the digital transition, the frequency of data analysis, and the types of analyses carried out to address the propositions listed below, a conceptual framework and digital metrics mapping, represented by Picture 1, were developed to better understand these challenges (Ahmad et al., 2021).

Figure 2: Basic conceptual framework



Source: Ahmad et al. (2021)

Rarely do the measures expressly target radical innovation initiatives. One implication is that assessments will be more heavily weighted toward anticipated market success and fiscal output than toward the process itself. In Table I, we present the most common metrics for innovation projects, their relevance, and their consequences for radical innovation programs (Kristiansen & Ritala, 2018).

Figure 3: The most popular indexes of Digital Economy

Index name	Full name of index	Originator	First publication	Number of covered countries	Number of partial indicators
ISI	Information Society Index	IDC	1997	53	< 20
ERI	E-Readiness Index	EIU	2000	70	< 100
KEI	Knowledge Economy Index	WEF	2005	140	< 20
EGDI	E-Government Development Index	UNPAP	2002	182	< 10
IDI	ICT Development Index	ITU	2002	154	< 20
DAI	Digital Access Index	ITU	2003	178	< 10
TAI	Technology Achievement Index	UNDP	2001	72	< 10
NRI	Networked Readiness Index	WEF	2002	148	< 80
DOI	Digital Opportunity Index	ITU	2005	181	< 20
ICT-OI	ICT Opportunity Index	ITU	2005	183	< 20
ICT-DI	ICT Diffusion Index	UNCTAD	2006	180	< 10
IS	Infostates	ORBICOM	2003	183	< 20
DESI	Digital Economy and Society Index	EU	2014	28	< 40

Source: Moroz (2017)

Conclusions and recommendations

The article is focused on measurement of the digitization and monitor the effects of digitization on the economy of the company, development of employee skills and other parts. The Industry 4.0 is an important part of digitization because if the company wants to be successful, it has to adapt to the conditions on the market and to the Industry 4.0. The article will help a chosen company to identify its position regarding the digitization process, analyze its level of innovation and identify deficiencies of their innovative processes based on suitable composite indicators. After identifying errors, the company can take the necessary steps to correct them and make the company more efficient and profitable. Since the digitization is a process that requires actions of all parts of the company it is important to set a goal where the entire company would be included. Another crucial part of a measuring digitization is to choose a suitable composite indicator where the company has enough data to work with and analyze the situation. After the analysis, the company should be able to take a corrective measure which will improve its efficiency and position on the market.

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Circular economy for a sustainable growth: Albanian case

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Abstract

Following the commitments at national and international strategic framework, especially European integration, the Government of Albania is engaged in ways to promote sustainable development through initiatives that are in line with global trends. This paper aims at providing an analysis of the importance of the circular economy to sustainable growth, focused on current situation and perspective for Albania. The importance of this study stands with the fact that the circular economy is one of the main blocks of the European Union's new agenda for sustainable growth. Under this study is performed an analysis of the legal framework related to circular economy, governmental interventions and their role in promoting and developing it, following the commitments that Albanian Government has undertaken in the process of EU integration and Sustainable Development Goals Agenda. Descriptive and SWOT analysis will serve as methodological instruments for this study, followed by a comparative analyses of WB countries regarding initiatives undertaken and concrete actions implemented in relation to circular economy. More focus will be given to Albanian case, explaining the steps undertaken by the Government for facilitating the circular economy development in line with commitments in the process of EU integration. The findings of the paper will help to reveal the role of the circular economy in improving economic performance and facilitating EU integration process. They will also help decision makers and research to better tailor appropriate strategies in order to develop and promote circular economy in our country.

Keywords: economic growth, circular economy, sustainable development, European integration

Jel Code: B22

1. Introduction

The circular economy (CE) is taking an important place in discussions on sustainable transformation agenda as a promising strategy for sustainable development (Schroeder et al., 2019). The discussion of circular economy is part of EU agenda, with focus of its role in

sustainable development. The principles of CE are in focus of a range of disciplines and branches, including industrial ecology, ecological economics, agriculture and environmental economics (Ghisellini et al., 2016). This is way we can not see it as a mechanism related to ecological and environmental issues, bur as well as an important instrument for stimulating the development of a sustainable, regenerative, and resilient socioeconomic system.

Despite the interest that Governments are showing on CE, it is worth to mention that its implementation is a challenge because of some barriers related to technological, regulatory, and cultural and market aspects such as a) lacking technologies to implement CE b) Lacking policies and strategies to support a circular economy transition c) Lacking education, awareness and/or willingness to engage with the circular economy, d) Lacking economic viability of circular economy business.

Albania is engaged in the process of transition from a linear economy to a circular economy. The transition to a circular economy model is considered as important mechanism to a sustainable growth and welfare in Albania.

2. Methodology and data

The study is based on a qualitative analysis of research and policy papers, which have in focus the framework for a transition to a circular economy. In addition, SWOT analysis is used as a methodological instrument to identify the internal and external factors that influence the establishment of a CE in Albania. Primary and secondary data are used, combined with a literature review used to identify the theoretical framework related to CE as well as some practical examples related to its development. Semi structured interviews serve as instruments to collect information needed to prepare the SWOT and answer key research questions such as: a) What is the circular economy, and what is its role in sustainable development? b) what are key characteristics to enable the establishment of a circular economic? Where are the biggest opportunities to build and expand the circular economy? What are barriers for developing CE? How transitioning towards a circular economy affects the implementation of the 2030 Agenda

3. Circular economy

Circular economy represents an innovative production and consumption model that ensures sustainable growth. It contributes to the optimization of limited resources, reduction of consumption of raw materials, and recovering waste by recycling or giving it a second life as a new product. Circular economy uses both linear economy definitions (in terms of economic benefits) and sustainable concepts (for environmental and socio-economic sustainable

development). The difference is that a circular economy makes the production of goods more eco-effective. There are several key elements that make the transition from a linear to a circular economy possible, such as improving prevention, management and recycling waste, investing in renewable energy sources, protecting biodiversity, sustainably extracting and cycling water resources, responsible consumption, and extending the utility of products' environmental ecosystems.

Figure 1: Transition to a circular economy



Source: Circular economy in the Western Balkan region: waste management as a challenge, The Balkan Forum,

May 2021

3.1 Some definitions of the CE

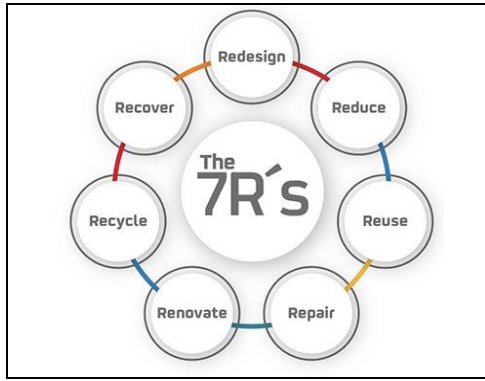
The World Economic Forum's Definition of Circular Economy "A circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, systems, and business models."

Ellen McArthur Foundation's Definition of Circular Economy "Looking beyond the current take-make-dispose extractive industrial model, a circular economy aims to redefine growth, focusing on positive society-wide benefits. It entails gradually decoupling economic activity from the consumption of finite resources and designing waste out of the system. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital. It is based on three principles: design out waste and pollution; keep products and materials in use; regenerate natural systems." Making the most of the natural resources available by applying the 3R basic principles of the CE, i.e. reduce, reuse, recycle is the aim of the circular economy. The circular economy contributes to the establishment of a more sustainable production and consumption model in which raw materials are kept longer in production cycles and can be used repeatedly, therefore generating much less waste.

3.2 The principles of CE: From 3R to 7R

Most of us are familiar with the 3R rule, which is essential for sustainable development and preserving the environmental balance: reduce, reuse, and recycle.

Figure 2: The 7R's of circular economy



Source: Repsol global

What are the principles of the circular economy?

According to 3Rs what is obtained from nature returns to it when its lifecycle is over in a cyclical and environmentally friendly way. But, debates on CE have added four other rules, in addition to the existing three, which are considered as additional steps needed to achieve a circular economy model which are following:

- a) *Redesign*: Thinking and designing products so that their manufacturing process consumes fewer raw materials, extends their lifecycle, and generates less waste (or at least waste that is easier to recycle). This increases environmental protection.
- b) *Reduce*: Change our consumption habits towards a more sustainable model. If we reduce consumption, we avoid the generation of waste, the use of raw materials, and therefore reduce the impact on the environment.
- c) *Reuse*: Reusing or repurposing products to extend their lifecycle.
- d) *Repair*: Until now, when a product broke down, we tended to replace it. However, repairing it is not only cheaper, but also avoids the use of new raw materials, saves energy, and does not generate environmental waste.
- e) *Renovate*: Update old objects so that they can be reused as vintage, e.g. furniture.
- f) *Recycle*: Promote best practices in waste management and use what you can as raw material to manufacture new products.
- g) *Recover*: Give new uses to products that are going to be discarded, for example, using plastic bottles to create watering systems, flower pots, or bird feeders.

What are the benefits of a CE

Environmental benefits: Reduction of Negative Externalities

Following the 3R principles negative externalities such as land use, soil, water and air pollution are better managed, as well as the emission of toxic substances and climate change. If we refer to agriculture, the principles of the circular economy on the farming system ensure that important nutrients are returned to the soil, which softens the exploitation of land and natural ecosystems. In this way, the soil gets healthier and more resilient, allowing a greater balance in the ecosystems that surround it.

According to Ellen MacArthur Foundation study a circular economy model working in Europe's food systems has the potential to decrease 80% of the use of artificial fertilizer and therefore contributing to the natural balance of soils. In addition, CE contribute to environmental protection through reduction of emissions, minimization of the consumption of natural resources and reduction of waste.

Economic and social benefits: development of CE provides benefits to the local economy by encouraging production models based on the reuse of nearby waste as raw material. It drives **employment growth through** stimulation of the development of a new, more innovative and competitive industrial model, higher economic growth, and more employment. In addition, the reuse of local resources can lead to less dependence on imported raw materials.

The impact of CE on growth and welfare is based on the followings

Competitiveness increase: If businesses apply CE model that are less dependent on the use of raw materials they can benefit from a cost structure less exposed to the risky price volatility. Recent estimates suggest that potential benefits by 2030 will include a reduction of 17-24% in resource use, savings of 630 billion euros a year and 3.9% growth in European GDP

Innovation promotion: CE business models are based on ne technologies and digitalisation which push towards innovation. Those allows businesses to rethink their processes and open up to new opportunities in every business sector

Protect environment: CE aims to limit environmental impact which contributes in reducing waste and atmospheric pollution and in controlling global heating.

Create jobs: CE model, reducing the amount of raw materials used and applying value-added services, is expected to shift the balance of cost structures from raw materials to 'work', i.e. from more automated sectors towards those linked prevalently to human activity (services, maintenance, repair work).

Contribute to welfare: Promoting jobs and protecting environment contribute directly to a better lifestyle for the population and increase the welfare.

4. Circular economy in EU and Agenda 2030 for sustainable development

The European Union has considered the adoption of CE models as one of its strategic priorities. The EU's new circular action plan paves the way for a cleaner and more competitive Europe. The European Commission adopted the new circular economy action plan (CEAP) in March 2020.

It is one of the main building blocks of the European Green Deal, Europe's new agenda for sustainable growth. The new action plan announces initiatives along the entire life cycle of products. It targets how products are designed, promotes circular economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented and the resources used are kept in the EU economy for as long as possible. The concept of a circular economy, address the roots of an economy in which waste and pollution do not exist by design, products and materials are kept in use, and natural systems are regenerated. As such it provides much promise to accelerate implementation of the 2030 Agenda. The circular economy holds particular promise for achieving multiple SDGs, including SDGs 6 on energy, 8 on economic growth, 11 on sustainable cities, 12 on sustainable consumption and production, 13 on climate change, 14 on oceans, and 15 on life on land.

5. Circular Economy in the WB

The circular economy, is considered an important subject on the agenda for the European Commission's policies for the Western Balkans region. The circular economy section in the Western Balkans leaders' declaration, taken from the 2020 Sofia Summit, is in line with the initiatives documented in the *EC Guidelines for the Implementation of the Green Agenda for the Western Balkans - An Economic and Investment Plan for the Western Balkans*. The Paris Agreement commitments are also included in this document. This topic opens a door for enhanced synergies regarding the circular economy among the Western Balkan countries aiming to encourage innovations and best practices, foster cooperation. The Western Balkan region is a major user and producer of natural resources. Their production and consumption requires a lot of energy and leads to environmental damage and increased sensitivity to climate change. The WBs countries have undertaken some steps in developing CE. Serbia, Montenegro, has approved a Road map for circular economy. Bosnia and Hercegovina started preparation of the Road Map, CE policy brief is prepared by North Macedonia. Kosovo and Albania are at the beginning of the journey to CE. Refer to the table below for further information. The Road Maps are a guide to circular economy transition models that equally focus on profit, environmental protection and preservation of resources. Economic, social and environmental dimensions are given equal importance. The goal of the Roadmap is to encourage manufacturing with the use of circular business models, to motivate the industry to create new jobs, and to improve doing business by finding innovative and sustainable solutions for the market.

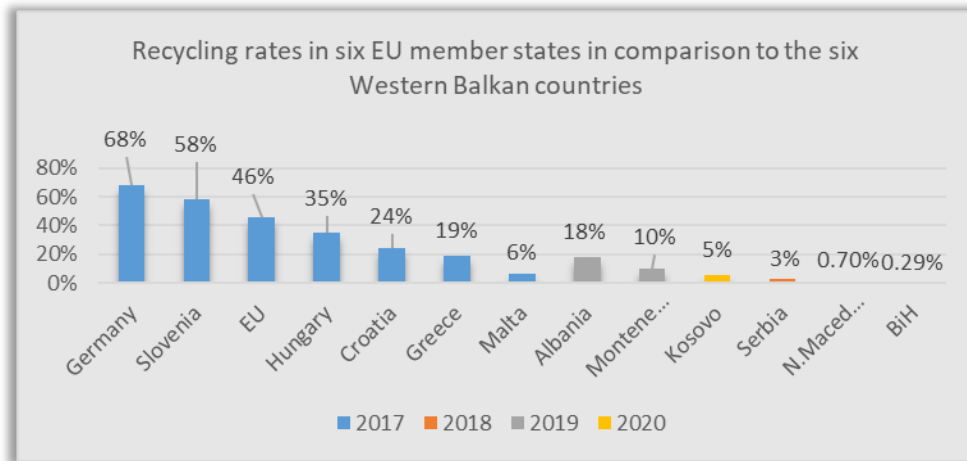
Table 1: WB countries where they stand with transition to CE

Country	CE legal framework	Comments
Albania	Strategy for integrated waste management 2018-2023	Part of the strategy is dedicated to legal framework for a CE and a national sectoral policy based on the CE priorities defined in EU CE Action plan
Bosnia and Hercegovina	Road map	B&H is on the way of preparing the Road map on CE supported by UNDP
Kosovo		Kosovo started the process of creating the circular economy transition framework
Montenegro	Road Map	The Road Map is a guide to circular economy transition models that equally focus on profit, environmental protection and preservation of resources. Economic, social and environmental dimensions are given equal importance.
North Macedonia	Policy brief	The Republic of North Macedonia has developed a policy brief on the CE and climate change identifying opportunities and challenges
Serbia	Road map	The Road Map is a guide to circular economy transition models that equally focus on profit, environmental protection and preservation of resources. Economic, social and environmental dimensions are given equal importance.

Source: Authors conclusions

Despite the achievements it is still a lot to be done by WB countries. Let's refer to the recycling rates as for the figures below:

Figure 3: Recycling rates in six EU member states in comparison to the six Western Balkan countries



Source: European Environmental, Kosovo Environment protection agency, INSTAT

6. SWOT analyses for transition to a circular economy

The SWOT analyses below is result of literature review as well as semi structured interviews with different stakeholders representing public administration, business and CSOs

Figure 4: SWOT analyses for transition to a circular economy

Strengths	Opportunities
Commitment to EU integration and Agenda 2030	Use of funding instruments.
Increased awareness of actors to the role of CE in sustainable economy development	Increase knowledge of new generation on CE
Increased involvement of CSOs and donors in initiatives regarding CE	Regional initiatives in the framework of cooperation among governments in Western Balkan Countries
Good will of Government to undertake concrete steps to promote CE and activation of Line Ministries in this process	EU financial support regarding Innovation
Concrete initiatives regarding waste management and solar energy	Establishment of new technologies
	Financing programs for innovation Horizon 2020

Weaknesses	Threats
No dedicated legislation/strategy for CE	Lack of access to funding.
Insufficient investment in R&D projects to promote circular economy.	Dependence on importation of inputs
Limited knowledge about CE	Climate change regulations.
Difficulties related to transposition and implementation of EU Directives	Big discrepancy between the goals set in the strategy and the reality
Lack of resources (financial and human	The development lagged far behind the agreed targets
Poor coordination among institutions	Corruption
Lacking (proven) technologies to. Implement CE.	Poor financial support to R&D
Traditional production system and lacking economic viability of. Circular economy business. models	Challenge of changing of the model of economic growth
	Few projects and partnership with other countries

Source: Authors conclusions

7. Albania towards a circular economy

Albania is engaged in the process of transition from a linear economy to a circular economy. The transition to a circular economy model is considered as important mechanism to a sustainable growth and welfare in Albania. In its path to EU integration and achievement of Agenda 2030 framework Albania has undertaken concrete steps and actions to this aim. Western Balkans Declaration on the Green Agenda was signed at the Sofia Summit. One of the areas for which commitment has been made for development is the Circular Economy, aiming at improving the sustainability in the production of raw materials, applying an approach to the industrial ecosystem in the region to guarantee the renewal of the environment, the development of circular economy strategies.

Albanian Government is engaged in establishment of a legal framework which will help the transition to a circular economy. GoA has approved the Strategic Policy of Integrated Waste Management and the National Plan 2020-2035 Law on Protection of Environment defines the key principles for supporting CE and Green Growth. In the Government Program for the period 2021-2025 is emphasized the aim to reduce and further eliminate single-use plastic. The government is heavily investing in the construction of incinerators which will be used to burn municipal wastes.

Sustainable Procurement is considered in the new law No. 162/2020, which contains provisions for the promotion and encouragement of innovation, including procurement procedures through the innovation partnership procedure, which are in accordance with the provisions of Directives 2014/24/EU. The government has launched a project which will help citizens to use alternative energy. The project concerns the installation of photovoltaic panels for 2,000 families, which will be supported by financing 70% of the cost of purchasing and installing solar panels. In fact, the installation of solar panels has been done by the citizens themselves for years as a way to save energy.

The transition to a circular economy calls for more actions from the Government. Establishment of a complete legal and institutional framework has to be accompanied by interventions which support the development of industries which are based on principles of CE. Concrete steps that can be undertaken are related to financial support. (Bourgon, 2017) is suggesting a serious tax reform that will shift taxes to a resource-based system rather than the existing labour based one, as an important vehicle to reinforce Circular Economy. Value Added Tax (VAT) differentiation is considered as a mechanism to nudge consumer behavior. Given the choice between two (otherwise) equal goods or services, even a moderate VAT difference can effectively nudge consumers to purchase circular products over products offered without a regenerative business strategy (Ecopreneur, 2019). In addition, there is important that the Governments create 'a level playing field' for industries who are investing in technologies that protect the environment.

8. Conclusions and recommendations

The concept of circular economy is still in its early stages in WBs and in Albania. There is an increased interest on circular economy model taking into consideration the *benefits of circular economy related to* Environment Protection, economic and social development, increased competitiveness, promotion of innovation, creating jobs, increasing welfare. The transition to a circular economy model is considered as important mechanism to a sustainable growth and welfare in Albania. In its path to EU integration and achievement of Agenda 2030 framework Albania has undertaken concrete steps and actions to this aim.

Western Balkans Declaration on the Green Agenda was signed at the Sofia Summit.

There are initiatives from private business companies to move their activity towards circular economy through waste management and waste to resource phases. Government of Albania has undertaken some concrete steps to prepare the strategic framework for transition to circular economy

Despite that, there is still a lot to be done by the central government or local municipalities to embrace the circular economy approach and impose strict regulations on waste management.

Institutional and regulatory barriers are significant, along with technological and financial barriers to the uptake of CE strategies. Analyses show that the institutional environment can be both an enabling and a constraining factor in the transition toward the CE.

The initiatives undertaken by the Government in adapting the legal framework with EU requirements should be accompanied by setting up the requested institutions and capacities to implement them as well as improving the understanding of tasks and responsibilities of the institutions involved and coordination and cooperation among them. The multi stakeholders approach should be used to implement the CE based on the fact that the transition from a linear to a circular economy requires a joint effort by stakeholders from all sectors.

Policy actions recommended:

Consider the transition to a circular economy as an important pillar of government policy and develop a joint, government-wide agenda ‘circular economy’

Develop legal framework related to CE

Develop incentives and incorporate them in Budget Programs.

Formulate overarching objectives based on the joint vision.

Develop interinstitutional mechanisms and multi stakeholders approach

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Circular economy in the Tourism Industry, Case of Albania

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Abstract

Local socio-economic activities depend on local resources that are not only limited to natural ones, infrastructure, etc., but also include the culture, climate and communities. One of the sectors that has a significant impact on these resources is that of tourism, which plays an important role because of its economic and employment potential as well as its social and environmental implications. That said, this sector is increasing the pressure especially on the environment. As a result, there is a need to create new circular economy models, which will not be limited to the current linear "extraction-use-disposal" one, but also will manage the resulting waste in an economically and environmentally appropriate manner. In this framework, the aim of the paper is to understand and interpret the circular economy model in general and how it can be interpreted and implemented in the tourism sector. The transition towards circular economy in the area of tourism is not simple and for this reason it is important to identify some of the main challenges in this process. In this regard, the main contribution of this paper is that besides the contextual understanding of circular tourism, it aims to provide some recommendations that will facilitate the transition towards circular economy in the tourism sector of Albania.

Keywords: circular economy, challenges, waste, tourism, Albania.

Jel Code: O14, Q56, Z32.

Introduction

Local socio-economic activities depend on local resources that are not only limited to natural resources, infrastructure, etc., but also include the culture, climate and communities. In this regard, for a region to be sustainable, its resources must not be damaged by its socio-economic activities and their quality improvements can lead to enhancement of socioeconomic activities.

One of the sectors that has a significant impact on these resources is tourism, which plays an important role because of its economic and employment potential. It contributes to the areas development: local development is boosted by the infrastructures created for tourism purposes;

jobs created or maintained can help counteract industrial or rural decline. Otherwise, it is also one of the major sources of waste generation having serious environmental impacts. Also, tourism sector is mainly operated by for-profit actors, who are focused the most on economic benefits. Based on this fact and the seasonal nature that this factor has, recently has been developed the “mass tourism” and this strengthens the damaging effects tourism has on nature and society, by producing negative externalities.

As a result, there is a need to create new circular economy models that will manage the resulting waste in an economically and environmentally appropriate manner. In this framework, the aim of the paper is to understand and interpret the circular economy model in general and how it can be interpreted and implemented in the tourism sector. The transition towards circular economy in the area of tourism is not simple and for this reason it is important to identify some of the main challenges in this process. In this regard, the main contribution of this paper is to provide some recommendations that will facilitate the transition towards circular economy in the tourism sector of Albania.

Literature Review

Based on the literature review related to “circular economy”, it is mainly related to ecological economics, environmental economics, and industrial ecology. It all started initially with the 3Rs – Reduce, Reuse and Recycle (Ghisellini et al., 2016). Later, other scholars, looked at adding another R referring to Recover to the 3Rs making it the 4Rs. With time, the 4Rs became 6Rs to include Reuse, Recycle, Redesign, Remanufacture, Reduce and Recover (Sihvonen & Ritola, 2015) and then 9Rs to include Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose and Recycle (Khaw-Ngern et al., 2021). Moreover, the concept of the circular economy is expanded to 12 Rs: reduce, reuse, recycle/reclaim, repair, refurbish/recondition, repurpose, redesign, remanufacture, research and development of process and technological innovation, reskilled people, reverse supply chain management and re-industrial green revolution (Charter 2019).

While, according Kek et al.’s (2013), the circular economy in tourism sector takes into consideration several factors such as:

- Sustainable mobility (environmentally friendly types of transport, sharing economy)
- Food (locally produced food, short supply chains, and community gardens)
- Community and other tourist accommodation (diffused hotels)
- Reuse of items/objects (reuse centers, social entrepreneurship)
- Other areas potentially associated with the closing of material loops in tourism

Other researchers, give broader aspects of circular tourism concept. Nedyalkova (2018) defined circular tourism as a model able to create a virtuous circle that produces goods and services without losing the limited resources of the planet that are raw materials, water, and energy, which limits the impact on the environment and (travellers, host, tour operator, supplier) adopt an ecological and responsible approach. According to Rodríguez et al. (2020), circularity in tourism can be found

in rural and cultural tourism; in the application of renewable energy in the tourism sector (like renewable energy and cleaner production solutions); in hotels and tourists' circular practices (like eco-innovations); in the maritime sector affected by tourism (like marine litter and micro plastics); in waste generation in tourism (like recycling and secondary raw materials) and in resources in the tourism sector (like infrastructure, climate change etc.). Girard and Nocca (2017) drew attention to the fact that circular tourism is not equal to green tourism. The latter focuses on limiting the consumption and waste of non-renewable energy sources. However, in circular tourism recovery, reuse, redevelopment, valorisation, and regeneration are the key words.

From Linear to Circular

Today's market economies are based on the linear regime 'take-make-dispose' that is based on continuous economic growth and increasing resource throughput. It is focused on production without thinking on optimizing the materials through their recycling or recovery generating garbage and waste resulting in pollution. Whereas circular economy demands for alternative solutions over the entire life cycle of products and services. It mainly relies on value creation through restoration, regeneration and re-use of resources. Although the circular economy has the same goal as the linear economy (i.e. economic growth), it takes into consideration to increase productivity, optimize the use of natural and human resources and increase efficiency in resource management.

The circular economy eliminates the notion of waste and inefficiencies of the current 'take-make-waste' linear economy by keeping materials, resources and products in use for as long as possible. Also, it creates an economic opportunity through material savings, supply risk mitigation, innovation, job creation, improved productivity, and long-term resilience, mainly because it considers as valuable sticks to be used again, not as materials that once flow through the economic cycle (MC Kinsey 2014).

According to Geels 2002, the transition process from a linear model to a circular model is a multilevel process in which we can distinguish three different levels/indicators in which the processes of change occur. The macro factors include the ones that affect the economy as a whole, such as: prices, economic growth, wars, emigration, globalization, political coalitions, cultural and normative values, environmental problems such as climate change and scarcity of resources, etc. The meso-economic indicators describe the economic, environmental or social performance of a region, a product group or an industry and analyze in more details the material flows in the economy and focus on consumption activity. This helps to identify the waste of materials, potential pollution sources and the opportunities to be more efficient, by encouraging or constraining activities in the community. Micro level indicators provide information for specific decision processes at business or local level or concerning specific substance or individual products. Micro level indicators support the implementation of policies and decisions in areas such as product policies, energy efficiency, and integrated waste management.

Although the implementation of the circular economy has its benefits, it should be noted that this implementation has numerous challenges and problems. First of all are the *thermodynamic constraints*, according to which will always be physical and qualitative losses on closed material

cycle. After that, there are *regional constraints* that consist in the improvements of environmental objectives on regional and local levels. Since many products are exported, change in land use due to the circular economy can be challenging to access comprehensively. *The cost-effectiveness perspective* is a factor that highlights the fact that using natural resources is less expensive than using recycled one. The use of materials that are regarded as waste requires regulation, and there is a requirement for a permit to process waste professionally making the *legislation* a very important factor towards circular economy implementation. Based on the fact that there are some sectors or businesses that produce new raw materials, this means that *the benefits of circular economy aren't equally distributed*. The last factor are *people's attitude and values* because society's viewpoint needs to be changed to favor a circular economy.

Tourism and circular economy

Tourism is a bivalent sector: on one hand, it contributes to socio-economic status and, on the other hand, creates the degradation of the natural environment, mainly because it creates great pressure on local resources generated from the increase in the level of waste generation, as well as air and acoustic pollution. According to Eurostat, in 2019, the tourism industries employed around 12.5 million persons. Enterprises in industries with tourism-related activities accounted for 10% of the persons employed in the entire non-financial business economy and 22% of persons employed in the services sector. Also, the tourism industry is a major employer of women. In 2020, compared with the total non-financial business economy where 36 % of people employed were female, the labor force of the tourism industries included more female workers (58%) than male workers.

Based on the multiplier effect it has on the economy, it is needed the adaption of circular economy in the tourism industry, because it recognizes the fundamental role of the environment and aims to create a further value from existing products as long as possible and turning them into resources. By applying a circular economy approach, tourism businesses can speed up their own sustainable development and advance in the creation of more circular experiences for all stakeholders in the tourism sector.

However, implementing circular economy principles in tourism could be one way of referring to circularity in tourism (Rodríguez, Jacob, et al., 2020). According to Vatansever et al., (2021), several barriers make it challenging the transition from a linear economy to a circular economy in the tourism sector such as strategy and infrastructure of the destination as two factors of great impact in the circularity in the tourism sector. Also, in order to achieve the main objectives of a circular transition are needed integration, communication, and engagement of all the actors included in the process.

In this regard, there are some cases where circular principles can be implemented:

Use and life extension models: the extension of use-intensity can be implemented in the tourism sector by prioritizing a collaborative consumption model based on sharing or leasing products and space. An example of a hugely popular and profitable sharing service is Airbnb, which provides a sharing platform for accommodation.

Circular design models: Hospitality providers can improve their services by using new sustainable technologies.

Value recovery models: in order to drive the tourism sector towards zero waste, the hospitality providers must strive for increased recycling and recovery of products, materials, and food. Food waste can be reduced by donating left-overs for free or for a small price.

Circular support models: the development of digital technologies can help in the transition to a circular tourism economy.

Case of Albania

During the last 3 years, the figures of foreign tourists who entered in the Republic of Albania are: in 2019 – 6,406,038; in 2020 – 2,657,818 and in 2021 – 5,657,649. The data of 2021 is attributed to the pandemic caused by Covid-19 which limited the movement of people, as a result of the restrictive measures that were taken to curb the spread of the negative consequences of the pandemic. However, the figures show positive results, because comparing the number of tourists in August 2021 with August 2022, an increase of 17.5% is observed. According to the Bank of Albania, the income of tourists for the 6 months of 2022 is calculated at around 1.13 billion euros.

Given tourism's contribution to the economy's growth, the government of Albania has issued a National Strategy for Tourism, which indicates the meaning of sustainable tourism and guides stakeholders in realizing sustainability in tourism activities. According to it, tourism is observed as one of the sectors that bring more income to the state, business and family budget. In this strategy, it is predicted that by 2028, the sector can account for up to 9.3% of GDP. Thus, taking into consideration this upward trend, it is predicted that by 2028 the direct and indirect effect of the tourism sector will approach about 1/3 of the entire GDP of Albania. Referring to employment, by 2028 is expected that 8.8% of the entire workforce in Albania to be employed in the tourism sector. Meanwhile the investment in the country are expected to be 8.2% by 2028.

Circular economy in Albania, Tourism Sector

Regarding the situation in the Republic of Albania, the concept of 'circular economy' is still at an early stage. The current legal framework, including national regulations and national strategic documents and action plans, does not provide a basis for the implementation of the concept of circular economy in the country. Therefore, there is an urgent need for enhancements in the current legal framework that will increase the country's ability to better utilize its resources and the lifecycle of materials, products, and services. In order to give a general view of the circular economy in tourism sector, will be used the following pillars:

Production and consumption, where waste is inevitably created from the starting process of food making until its delivery. Once food turns into waste, all the resources that were used for production, namely water, energy and limited environmental resources are all wasted. This trend of food misuse contradicts the principles of circular economy. Green Public Procurement (GPP) has a significant role in fostering circular economy at local and central levels by purchasing goods and services that help to develop a more sustainable production and consumption without causing

harm to environment. Unfortunately, there are no statistical data to be found whether Albania has embraced the GPP approach.

Waste management

Albania lacks the plan and infrastructure to manage wastes in an environmentally-friendly manner by reducing, reusing, separate collection of waste materials and recycling, regarded as the most ecological practices determined in the waste hierarchy pyramid. Considering that the government has given priority to construction of landfills and incinerators, there is little effort and allocated financial resources to create recycling plants, which reflects the small percentage of recycled wastes compared with the total waste amount, 18.7% (in 2019), with a difference of only 0.2% compared with the previous year (in 2018 18.5% of waste was recycled). The low level of recycling and differential waste collection lead to the loss of potential valuable natural resources, negative impact on the environment and increase of the amount of waste needed for disposal.

Secondary raw materials

The usage of secondary raw materials accounts for a low or insignificant number of materials used for making new products, considering that the amount of recycled and reused wastes constitutes a small portion of the total waste volume. Currently in Albania exist about 60 recycling companies spread throughout the country, with a total recycling capacity rounding at 500,000 tones. Most of the recycled/separated at source wastes include glass bottles (reused for beverage companies), paper and cardboard, steel scrap (processed in the metallurgical plant of Elbasan), etc.

Competitiveness and innovation

In the spectrum of a circular economy, there are not any explicit data from any reliable sources, which reflect the development of competitiveness and innovation between the companies aspiring to offer products and services of the same nature. The only development to be mentioned is related to the investment in technology that the above-mentioned companies have put in place to enhance their production line and manage waste treatment.

Challenges specific to the tourism sector of Albania

Tax system favors linear economy and does not support CE

A key challenge in Albanian tourism sector is the tax system that promotes linear practices rather than circular practices. Tax reductions aim to promote the creation of quality employment, the economic and social development of the Albania and diversification of its productive structure. However, the tax system does not focus on incentivizing the transition towards circular economy. One example in this regard, is the tourist's tax. On one side the tax would contribute to offset environmental degradation caused by the millions of tourists, renovate infrastructures, prevent overflow of Albanian's carrying capacity and provide funds to promote a more sustainable tourism. On the other side it might have a negative impact on tourist arrivals and burden on competitiveness. For this reason, there may be tax reductions for those businesses that undertake environmental investments (e.g. encouraging the reduction, recovery or correct environmental

treatment of waste). In the future, these kinds of initiatives should be pushed forwards as it could incentivize players in the tourism sector, such as hotels, to become more circular.

Inefficient waste management/recycling systems, practices and infrastructures.

Albania faces several challenges when dealing with the huge amounts of waste, because the efficient management of waste in the tourism sector of the Albania remains crucial in order to implement circular economy. One of the latest initiatives is the removal of plastic bags from the market and their replacement with recyclable bags.

Accurate and reliable information is not available making it difficult to implement looping actions

There is a lack of accurate and reliable information on who is already performing circular economy practices across the sector, because there are no circular economy certifications/label for tourism businesses and destinations. Therefore, in order to be able to identify the tourism stakeholders that are performing their activities on a circular way, efforts are needed to identify and provide a circular label/certificate special for tourism, to the resident population, tourists and other stakeholders interested in having circular economy partners for their businesses. This will facilitate the implementation of circular economy practices across the tourism value chain as more companies will be more aware of the different stakeholders implementing it, facilitating synergies between businesses of the sector.

Conclusions

The attention given to circular economy has been increasing recently, although the literature related to it, and more specifically to the tourism sector, is quite limited. Through the design and implementation of adequate policies, the circular economy aims to boost simultaneous positive outcomes for the economy, society, and the environment. In this regard, it contributes towards higher regional competitiveness and an equal distribution of economic growth and wealth, because it goes beyond the pursuit of waste prevention and reduction and considers technological, organizational, and social innovation throughout the value chain.

Tourism sector is slowly adapting circular economy principles and practices. The positive impacts of visitors are compared to negative externalities such as GHG emissions, resource consumption and local ecosystems' social, economic and environmental degradation. This is one of the main reasons that this sector and all the actors that are part of it should take into consideration the reduction of the used resources, the reuse of existing products, recycling what is suitable for that, and redesign, replace, and rethink operations, because these negative externalities are acute, real challenges that need serious, level-headed considerations from all tourism industry stakeholders.

The transition toward circular economy in the tourism sector requires some elements such as: a broader perspective, that takes in consideration environmental and socio-economic issues; a cross – sector approach, meaning that different sectors of the economy need to team up to have an efficient use of the resources; rethinking the business model and to take more into account renting instead of selling; Inclusive of all stakeholders where the tourist gets to make a choice. To this extent, circular tourist economy will lead to sustainable use of resources, improve the efficiency of the tourism industry and achieve sustainable development of the sector.

In conclusion, moving from a linear perspective to a circular one is a slow process, but the situation we are in shows that the current linear economy is causing problems that must be faced and opportunities must be evaluated to improve the situation by changing the economic rules of the game that consist of establishing sustainability in the mindset of every business and society. Although, it can be said that tourism industry has already made a step forward to circular concept through the rapid increase of the disruptive technologies that have contributed to the business model of collaborative consumption.

Recommendations

First of all, based on the limited literature regarding circular economy in the tourism sector, more empirical work and research is needed in order to generate possible solutions toward the economy transition. This is very important based on the positive, environmental and financial impact it has, in the tourism sector. Despite this, it is of great interest and important to measure and explain specific indicators that evaluate the circular economy implementation.

Developing a circular tourism economy could help to bring about the sustainable use of resources, enhance the efficiency of the tourism industry and achieve the sustainable development of tourism. However, it is difficult to accomplish without the relevant legislation and policies needed to support it. In the case of Albania, there is a lack of implementation of concrete policies in support of the circular economy, especially in the tourism sector. In this framework, the government can contribute towards the circular economy transition in the tourism sector through the following:

Promoting the implementation of circular economy through tax deductions for all the investment related to it.

Draft and implement laws that facilitates the application of circular economy in the tourism sector.

Involve all the actors of tourism sector in drafting an awareness program that will contribute in changing the mentality of tourists.

Use of public investments to raise awareness and promote sustainable production and consumption patterns

To design a system of incentives/penalties in order to increase awareness and change in the consumption habits of the resident population towards a circular economy model.

Designing policy instruments that contribute to greater supply and demand for circular products, services, reuse and recycled materials.

Considering the significant weight that public procurement has on GDP, the application of Green Public Procurement will be a step forward for transition towards circular economy. In turn, it will boost the production for environmentally friendly products and services in the domestic market.

Sometimes it is impossible to provide regenerative resources or lifetime extension, and waste streams are still generated, even in this case the businesses should rethink in using waste as a resource. In this regard, businesses can design processes such that they themselves can manage the cycling of their own materials or waste internally, or they can also operate with other organizations.

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"PINK" Circular Entrepreneurship Challenges: A Mind Genomics Survey

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Abstract

This paper is designed aiming to understand the need for cooperation to recover the economy in a more sustainable and inclusive model of development in Albania. Thus, a complex online experiment known as Mind Genomics is developed and delivered to academia, NGOs, municipalities, and businesses to stimulate industrial symbioses networks related to the circularity and decarbonization of relevant economic sectors of activity for developing more sustainable businesses where women should be engaged. Projects and activities to promote gender equality and women's involvement are typically concentrated in social sectors such as education, health, poverty eradication, etc. At the same time, only low aid levels have been targeted to technological, economic growth, and governance areas. A total of 120 students and professors of higher education institutions, NGOs, municipalities, and business staff in Albania participated in the study. They provided some personal data such as gender and age. They indicated one of three reasons they think women should be supported to develop, incubate and scale up green businesses and solutions in different sectors and areas of activity that contribute to circular and low-carbon cities to follow this new economy in the country. This study established as main pillars the following aspects: How to raise awareness towards a circular economy, How to help in the identification, dissemination, and connection of women entrepreneurs and developers in the circular economy, How to support the circular businesses managed by women and Which is the governmental position versus women circular businesses entrepreneurship.

Keywords: Pink circle, Sustainable Economy, Circular Businesses, Mind Genomics

Jel Code: F63, F64, L26

I. Introduction

The post COVID-19 pandemic crisis in Albania and the effects of the war in Ukraine have imposed the need for a new economic model which engages the perception and mentality challenges towards implementing a circular economy. Thus, the physical resources are provided, transformed, used, and disposed of to produce additional values through physical or online approaches. Obviously, various business models are inspired by value re-capture [1] or business mindsets with a particular focus on the environment [2].

A circular process is a totally new story of the business [3]. Its purpose integrates social, economic, and environmental goals as a company's core business, and profit is a novel way of doing business. At the same time, Europe has set out key actions for 2020-2025 and has committed to ensuring that the Commission will include an equality perspective in all EU policy areas (Youth action plan). Therefore, the European Consensus on Development identifies women as critical agents of development and change. The EU Global Strategy defines gender equality and women empowerment as cross-cutting priorities for all EU policies. The last has undertaken initiatives such as "Girls Go Circular" aiming to raise awareness regarding the: Circular Economy for Smartphones and Electronic Devices, the Circular Economy of Food in Cities, E-waste and the Circular Economy, Fashion and the Circular Economy, etc. Also, other recent private activities, such as an online seminar entitled: "Meet the women building a circular economy" are held. This experience can also connect the women entrepreneurs engaged in circular businesses while supporting the creation of networks.

Many sectors are already cooperating in EU research and SME areas to increase their know-how and efficiency on the European market and adopt the circular economy. In this light, it must be admitted that few cross-sectorial initiatives engage local societies, academia, NGOs, municipalities, and businesses in women's empowerment.

Meanwhile, the reality of Albania's aspiring European family may be troubling. Over the years, the country has been engaged in adapting and implementing strategies with main objectives such as a healthy ecological environment through the development of sustainable use of natural resources, the prevention of environmental contamination and degradation, and the promotion of environmental protection.

In this respect, the National Strategy/National Action Plan of Waste Management 2025 has been adopted, and some landfill sites are built and managed, the ones of Sharra, Bushat, Bajkaj, Maliq, and Elbasan. They help municipalities protect the environment and human health and ensure environmentally sound waste management despite emerging problems. It should also be evidenced that in the country, the only initiatives where women are involved in circular businesses are those related to second-hand products resale. The resale through Instagram accounts refers to fashion luxury second-hand products. At the same time, second-hand resale in dedicated municipality sites refers to different products such as clothes, home products, and household appliances.

Meanwhile, circular activities that have hired women are City Tex (a factory) and Social Crafting Garage Saranda, which the European Union funded through the CAUSE project (the women of the region produce handicrafts and mosaics aiming to create some know-how and independence).

Thus, this paper tries to contribute to the existing literature in three ways. First, this study addresses some aspects of women's entrepreneurship in circular businesses. Second, a well-known technology, Mind Genomics, is used to understand people's minds. Mind Genomics is a collection of very advanced technologies such as statistical regression models, data mining, and clustering techniques used to provide a multifactorial analysis of many factors influencing the decision-making process. Third, the final goal of this paper is to present to line institutions some valuable elements to be considered regarding the empowering circular economy and women leadership in this field in the country.

II. Literature review

Technology, fashion, and the economic revolution have produced an enormous amount of unfavorable products, materials, and services as consumer demand has changed through the years ([4], [5]). This was clear, especially in the post-COVID-19 pandemic, starting from February 2022 with the war in Ukraine. Furthermore, the consequences of the economic crisis and related challenges that our society faces today impose the need for a new economic model. Thus, there is an urgent need to establish a green economy to stimulate industrial symbioses networks related to the circularity and decarbonization of relevant economic sectors of activity. Also, there is a need to develop more sustainable businesses where women should be engaged. The last one would also help local economies in poverty eradication.

A popular concept that constitutes an attempt to reorganize the economy to solve the problems mentioned above is the [Circular Economy](#) (CE), according to [6] study.

But the concept of circular economy (CE) was initially introduced and is rooted in diverse theoretical backgrounds such as environmental economics, industrial ecology, ecological economics and 'cradle-to-cradle' ([7],[8],[9],[10]).

The research on the matter was driven by the need to better orient the economy's development. Otherwise, the latest directly affects the population's lives. It brings harmful elements such as climate change, increasing disparities between poor and rich regions. Natural disasters with more severe consequences, such as deteriorating air, soil, and water quality, directly impact declining human well-being [11]. Simultaneously, considering that human, material, and economic resources are limited, the amount of waste produced is progressively increasing [12].

In Europe, the CE is receiving increasing attention in the popular and scholarly discourse, as indicated, among other things, by the exponential growth of both practitioner and academic writings on the topic ([13], [14]).

But researchers around Europe have also highlighted a variety of CE barriers in recent years such as cultural ([15],[16], [17]), market ([18], [19], [20]), regulatory ([15], [19], [16], [21]) and technological ([18], [15], [21], [22], [23]).

However, a study exists that traces the experiences of Vicky, a female entrepreneur who runs a circular business that produces swim and active wear from regenerated fishing nets [24]. Meanwhile, in Albania is evidenced a gap in studies of similar nature.

Thus, this study aims to determine what students and professors of higher education institutions, NGOs, municipalities, and business staff in Albania think about women entrepreneurship challenges in circular businesses operating in Albania.

The study uses a well-known technology referred to as Mind Genomics or otherwise called the 'algebra of the mind' [25].

Mind Genomics is used in several studies such as finding customer requirements for natural food stores [26]; what concerns healthy people about the prospect of cancer [27]; study social problems: the case of corruption in education [28] to name a few.

This study brings to the existing literature a point of view of responders interested on the matter. This study sheds light on the perception and mentality challenges towards the implementation of circular economy and the women entrepreneurship in circular businesses.

III. Tools and methodology

III.1. Data collection

An online survey was delivered to 140 students and professors of higher education institutions, NGOs, municipalities, and business staff in Albania. Only 120 students and professors, NGOs, municipalities, and business staff responded positively to the participation invitation. Students and professors were from both programs: Bachelor and Masters. All these participants have been previously engaged in seminars, workshops and activities related to circular economy. In the Mind Genomics experiments each respondent sees and rates 24 different circumstances (vignettes). In this logic, 2.880 observations were collected. The participants also provided some personal data such as gender and age and indicated one of three reasons why they are in favor of women's entrepreneurship in circular businesses as follows: Gender equality promotion; Local economies empowering, Fostering economic growth.

III.2. Data statistics

Above 60% of the responders are male, and around 40% are female. Over 15% of the responders were students between 18-24 years old. Meanwhile, 24% of the responders were between 25-34

years old, 29.2% between 35-44 years old, 12.5% between 45-54 years old, 8.3% in age 55-64 years old, and 16.7% were over 65 years old (see **Table 1 : Participants` data**).

Table 1: Participants` data

Group (Binary Ratings)	Total	Male	Female	18 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65+	Gender equality	Fostering economic growth	Local economies
Base Size	2.880	1.752	1.128	432	696	840	360	240	480	720	922	1.238
Additive Constant	50	50	51	32	49	63	50	56	42	25	32	43

Source: Mind Genomics` elaborations

III.3. Tools and methodology

Ming Genomics is based on the Experimental Design Theory to create a complex system for gathering data from the experiment's participants. Four silos/questions are determined to represent the pillars of the study. The questions are designed to 'tell a story'. For each question, provide four different answers in the form of simple sentences are provided (see **Table 2:** Silos and the corresponding answers).

The system combines these answers into small vignettes that consist of 2, 3, or 4 questions and one answer from each question. Each respondent sees and rates 24 different vignettes. All people see DIFFERENT vignettes.

Table 2: Silos and the corresponding answers

Question A - How to raise the awareness towards circular economy?	
A1	The circular economy lessons/courses should be integrated in the educational curricula's

A2	Circular economy entrepreneurship seminars should be frequently held by municipalities, NGOs and universities
A3	Sponsorship of research dedicated to sustainable industrialization
A4	Implementation of sustainable cities and communities strategies
Question B-How to help in the identification, dissemination, and connection of women entrepreneurs and developers in circular economy?	
B1	Through social networks accounts promotion
B2	Through dedicated circular economy fairs organized by chamber of commerce and NGOs activities or universities conferences
B3	Through the "PINK circular entrepreneurship" open days held by universities and related research centers
B4	Common investments in dedicated circularity hubs (women can connect and ask for solutions as well as establish further businesses networks)
Question C –How to support the circular businesses managed by women?	
C1	Free expert advice to women circular businesses
C2	The green public procurement should be increased acting as a role-model
C3	Tax waiver for women start-up circular businesses for a 3 years period
C4	Designation of financial products for women entrepreneurship in circular businesses
Question D – Which is the governmental position versus women circular businesses entrepreneurship?	
D1	Lack of financial support for women circular start-up activities
D2	Governmental programs are not able to help circular women entrepreneurship
D3	Government grants are missing for women circular businesses
D4	Laws should be based on sound science-based evaluations in response to women circular entrepreneurship needs

Source: Authors` elaborations

III.4. Results

Results show that 50% of respondents (the intercept value) favor women's entrepreneurship in circular businesses. In general, 43% of students, professors, NGOs, municipalities, and business staff consider women's entrepreneurship in circular businesses important for **local economies empowering** reasons. Next, 32% of respondents believe it is important for **fostering economic growth**. **Gender equality promotion** is the least appreciated reason, 25%.

Results show that based on their statistical relevance, the four pillars/groups considered for this study are ordered as follows: The awareness towards the circular economy is evaluated with a value of 2.75. The support to the circular businesses managed by women pillar is evaluated with a value of 0.75. The governmental position versus women's circular businesses entrepreneurship pillar is evaluated with a value of 0.75. And last, the identification, dissemination, and connection of women entrepreneurs and developers in the circular economy pillar is evaluated with the value of -1.

The survey results show the more relevant aspects of women's circular business challenges from students, professors, NGOs, municipalities, and business staff operating in Albania.

The aspect of awareness towards circular economy shows these facts:

The element respondents' value the most (with a value of 4) is that the circular economy lessons/courses should be integrated into the educational curricula. Students in the group 18-24 value this item with 28, and all respondents older than 35 agree on the matter. They value this item from 1 to 9. Young professionals in the group 25-34 years old do not consider this a problem; they value this item with -2. Males and females value this item with 5 and 4, respectively.

In general respondents valued with 3 the idea that circular economy entrepreneurship seminars should be frequently held by municipalities, NGOs and universities. The respondents younger than 65 years old think that municipalities should often organize circular economy entrepreneurship seminars, NGOs, and universities, value this item with 5. The over 65 years old respondents disagree on this matter. Males (value this item with 5) favor these kinds of activities compared with females (they value this item with -1).

The idea of implementation of sustainable cities and communities strategies is supported (valued with 3) by the responders of the 18-34 years old group age (they valued it above 14.5) and 45-54 years old group age (they value this item with 8). The other responders do not support this idea. Meanwhile, males and females agree on this matter (they value it 4 and 2, respectively).

The issue of sponsorship of research dedicated to sustainable industrialization (in general is valued with 1) is positively evaluated from 18-24 years old (they value it with 12), 35-44 years old (they value it with 2), and 55-64 years old respondents (they value it with 17). Males agree with this

point (they value this item with 3), while females do not (they value this item with -1). The rest of the respondent groups do not agree on this matter.

The aspect of supporting the circular businesses managed by women shows these facts:

The element that respondents value the most is tax waiver for women start-up circular businesses for a three years period value this item on average with 3. Independently from age, the respondents agree on the matter. Males (they value it with 8) are more open about this idea than females (they value it with 1).

According to responders, another important element in this aspect is that green public procurement should be increased in acting as a role model; it is valued with 2. Responders of the group 18-24 years old (value this item with 2), 35-44 group age years old (value this item with 5), and over 55 years old (value this item on average with 12). Females support this element, while males do not.

The responders also consider the need for financial products for women entrepreneurship in circular businesses, and they value it with 1. Responders from 25-44 years old (value this item with 3) and over 55 years old (value this item on average with 3.5). The 18-24 and 45-54 years old responders' do not think there is a need for this kind of support (they value this item with -7.5). Females (they value this item with 4) think that financial support is necessary, while males disagree (they value this item with -5).

Meanwhile, the idea of free expert advice to women's circular businesses is not considered relevant (this item is valued at -3). Both males (they value this item with -4) and females (they value this item with -2) agree on this element.

The aspect of governmental position versus women's circular businesses entrepreneurship shows that the respondents have valued the item the most: Laws should be based on sound science-based evaluations in response to women's circular entrepreneurship needs (valued with 3). Except for the 35-44 years old group age, all the responders agree on this point (they value it on average with 4). Both males and females (value this item with 5) agree on the matter (value this item with 2).

The responders are indifferent concerning these issues: there is a lack of financial support for women's circular start-up activities, governmental programs cannot help circular women entrepreneurship, and government grants are missing for women's circular businesses.

The aspect of identification, dissemination, and connection of women entrepreneurs and developers in the circular economy is valued with -1. But in this aspect, the most valued element is one of the joint investments in dedicated circularity hubs (where women can connect and ask for solutions as well as establish further business networks). It is valued at 1. Females are positive about this element (they valued it with 3), while males are indifferent.

The results confirm that even when males and females, independently from their professions and age, have divergent thoughts on certain elements related to the matter, in general, they are both supportive of women's entrepreneurship in circular businesses.

IV. Conclusions and Recommendations

Despite the growing attention and necessity in Albania, the circular economy concept is still at an early stage of implementation, especially when dealing with women's entrepreneurship. Thus, we implemented the Mind Genomics experiments to students and professors of higher education institutions, NGOs, municipalities, and business staff to understand what they think on the matter to boost this new model of economy. The survey statistics show that initially, an awareness campaign is necessary. The circular economy culture concepts should be integrated into the educational curricula. In this aspect, not only schools and universities play an important role, but also NGOs and municipalities. The last ones should frequently hold circular economy entrepreneurship seminars or workshops aiming to implement sustainable cities and communities strategies further. This also helps in creating networks for businesses of similar nature. At the same time, presentations can also be done from the NGO part of the network about the circular economy, sharing their experience and providing information on project implementations in the country.

Referring to the support needed for circular businesses managed by women, the research reveals that tax waiver for women start-up circular businesses for a three years period is an important element that should be taken into consideration by the government and municipalities. Therefore, during this period, circular businesses can concentrate on market competition. Meanwhile, municipalities and the government should act as role models by increasing green public procurement. This could help circular businesses promote their products and grow as market demand for sustainable products increases. By pursuing the same logic, it can be evidenced that municipalities, governments, or financial institutions can also financially support women's circular activities or related investments in sustainable pieces of machinery.

Concerning the governmental position versus women's circular business entrepreneurship, the research shows that laws should be based on sound science-based evaluations in response to women's circular entrepreneurship needs. In fact, in Albania, there are still no acts or dedicated legislation requiring a transition to the circular economy, and furthermore, there is no subsidy or support for those who reduce, reuse, or recycle waste. In this context, the implementation of governmental programs is required to support circular women entrepreneurship. Moreover, the government should also provide grants for women's circular businesses and financial support for women's circular start-up activities.

The perception and mentality challenge towards implementing a circular economy in the country is to deal with public awareness. This further will obligate the line ministries and municipalities to better respond to economic agents' needs, including women entrepreneurs. Comparatively, NGOs and academia should continue to be involved in this process to stimulate industrial symbioses networks and promote and produce innovation on the matter.

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Green Marketing and its importance

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Abstract

The word "Green" has gained traction in today's language. Environmental concerns are crucial to business in the current economic climate. Green marketing refers to efforts that promote environmental sustainability, and it is critical for the contemporary market. The sustainability of green marketing, its tools, and marketing mix will all be covered in this essay. The significance of green marketing for both customers and the environment is also covered in this essay.

Key words: green, businesses, environment, marketing,

Jel Code: M31, Q56

Introduction

Environmental issues have always been a challenge, but the term "environmental sustainability" has increased consumer sensitivity toward buying greener products. Environmental pollution is a hot topic in today's business world. In recent decades, producers and consumers have both voiced concerns about how products affect the environment [1]. Green marketing is the practice of promoting goods that are thought to be more ecologically friendly than competing ones. A trend that has gained particular prominence in the contemporary market is green marketing. This idea has made it possible to remarket and package current products. Green marketing emphasizes selling environmentally sustainable goods to fulfill consumers' requirements and desires. In a larger sense, green marketing is corporate social responsibility because it encourages corporations to adopt socially conscious practices.

Goals of the Study

To be familiar with the idea of green marketing

Knowing the four pillars of green marketing

Research Methodology

Definition and Meaning of Green Marketing, according to the American Marketing Association, is the promotion of goods seen to be ecologically secure. Green or environmental marketing, according to Polonsky - "consists of all activities designed to generate and facilitate any exchanges intended to satisfy human needs or wants, such as the satisfaction of these needs and wants occurs, with minimal adverse impact on the natural environment." Presenting an ecologically sustainable product is only one aspect of green marketing. Additionally, it mentions and promotes a firm's procedures and business practices as having low impacts on the environment. The process of selling an offering based on its positive effects on the environment is referred to as green marketing, also known as eco-marketing or sustainable marketing. Green marketing is the practice of promoting goods and/or services based on their favorable effects on the environment. Such a good or service might be environmentally friendly, or it might have been created, produced, and/or packaged in an environmentally friendly manner.

Definition and Meaning of Green Products

Literally, "eco-friendly" means "friendly to the earth" or "not damaging to the environment," and term most often relates to items or behaviors that promote sustainable living. Consumer demand for goods and services that were produced in an environmentally responsible manner, including one that involves recycling and protecting the planet's resources, is known as "green consumerism." Consumers who are environmentally conscious or "green" choose products from a constantly expanding range of green options. Producers are responding to the need for green products by investing resources in the development of greener technology and green product lines because they recognize a new market for such products. This green revolution is taking place in full compliance with capitalism. The use of materials and manufacturing processes for the packaging of goods that has a low impact on both energy consumption and the environment is known as green packaging, also known as sustainable packaging. Sustainable packaging is produced with consideration for the environment, using recyclable, biodegradable, and energy-efficient materials (Merton, A., 2016). Packaging produces an astounding 77.9 tons of municipal solid garbage per year, according to the EPA.

By this, we mean that everyone should develop the product or service to be as environmentally friendly as possible. The most fundamental approach to green marketing is this one. A prime example of this is the solar water heater, which uses the least amount of energy due to its design.

Four P's of Green Marketing

Green Product

Evidence of less resource use and pollution is required for green products. Eco-friendly goods might advertise their greenness as a selling point. Energy conservation, organic, green chemicals, and local sourcing are among the trends in product labeling. Companies only need to use eco-friendly packaging to designate their items as green.

Green Promotion

Green marketing involves designing promotional tools, such as advertisements, marketing collateral, signage, white papers, websites, videos, and presentations, while keeping in mind the needs of people, the environment, and business interests. For instance, the Indian Tobacco Company has introduced chlorine-free, environmentally friendly papers and boards.

Green Place

Distribution logistics are vital, with an emphasis on environmentally friendly packaging. It is easier to advertise seasonal and local goods, such as vegetables from nearby farms than imported goods in terms of "greenness".

Green Price

The environmental benefit is typically a bonus, but it frequently distinguishes between goods of similar value and quality. The majority of clients will only be willing to spend more if they believe the product has more value.

Miller (2008) claims that green enterprises are expanding and those new businesses are following the trend. Of course, the corporation may choose to make a change on purpose occasionally, but not always. Polonsky (1994) identified five justifications for why businesses employ green marketing. Positive effects of green marketing on human and environmental health are seen. People are aware of pure products and pure production, use, and disposal processes for the products. It promotes combined efforts for purity production as well as consumption. A tool for preserving the environment for coming generations is green marketing. It improves the security of the surroundings. The green market is a new one that is emerging as a result of rising environmental protection awareness. Hotels must become more environmentally friendly in order to compete in this industry [2].

Green marketing contributes to a decrease in the usage of plastic and products made of plastic. Because plastic cannot biodegrade, it is not suitable for our planet. That implies that a single piece of plastic will exist eternally. Consider how much more plastic there will be if people continue to use it as they do now. Instead of the beauty of nature on television, we shall witness oceans and forests covered in garbage (Bhasin, 2019). The development of an environmentally friendly product is just one of many distinct aspects of green marketing, using environmentally friendly

packaging, implementing sustainable business processes, or concentrating marketing efforts on themes that highlight a product's green advantages.

Conclusion

Future research on the strategic, tactical, and operational aspects of green marketing in various social, economic, cultural, and political environments would be helpful as green marketing methods might exhibit distinctive characteristics in various circumstances. Opportunities for future research also arise in terms of how different outcomes of green marketing orientation (commercial, environmental, and social benefits) affect the performance of organizations operating in different industries. A question arises regarding the impact of various green marketing outcomes (commercial, environmental, and social advantages) on the success of firms engaged in various industries.

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The Circular Economy: A Value and/or an Interest (philosophical interpretation)

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Abstract

The report analyses the concept of the circular economy through the prism of two fundamental philosophical categories – value and interest. Supported is the standpoint that the topicality of the problems, connected with the circular economy, makes necessary their analysis in the discourse of the political philosophy, because the historical practice indicates that the significant social problems always call for a philosophical interpretation. The author offers a short retrospection of the emergence and development of the concept of the circular economy.

On the basis of the main characteristics of the circular economy as a new model of production and consumption, the author examines and analyses the question: “What is the circular economy? A value or an interest?” in the modern world.

Defended is the standpoint that the circular economy is both a human value and present a global interest and it is necessary that the analysis of the problem should be based on a synergy between the axiological and economic approaches, rather than on their confrontation.

Key words: Circular economy, Value, Interest, Philosophy

Jel Code: A13, F01, Q5

Introduction

The problem of the circular economy is widely discussed both at the level of the micro and macro-economic theory and in the practice of the national and international political decisions.

More than fifty years ago, the world was warned for the first time of the possible negative tendencies and implications of the development of the globalization process, combined with the goals and trends of mass industrial production. Young scientists from Massachusetts Institute of Technology sounded a warning about the negatives and dangers of the ongoing and accelerating growth in a long-term aspect. In a report, called “the Boundaries of Growth, prepared by the Roman club, awareness was raised of the disruption between the strife of man towards endless growth and the limited capacity of the planet, which is topical even these days. [1]

The topicality of the problematics is also determined by the fact that the circular economy is a leading political concept in the European Union, which comes as a response to the need to restore the positions of Europe in the global competitiveness and update the vision of its sustainable development. The Action Plan for the circular economy, published by the European Commission in December 2015, in its essence redefined society's approach to the production and consumption of goods, services and resources. This revolutionary transition calls for a new behavior of the member-states, producers and consumers, and the subjects of the economic and political decisions. This is a new philosophy of behavior, requiring theoretical analyses. In this sense, the topicality of the problem of the circular economy also calls for its reconsideration in the discourse of the political philosophy.

It is known that the circular economy is a new vision of the transformation of the model of the economy and development, established as a counterpoint to the downsides of the linear model of the mass industrial production. It is a world problem and aims at achieving interdependence between competitiveness and riches, preservation of the environment and biodiversity for the benefit of man.

The "circular economy" as a concept became a subject of discussions during the second half of the 20th century, despite the fact that the idea, which lies in its core, had arisen as early as the emergence of the economic relations, but gradually, during the years of fast economic upswing, the result of industrialization, its topicality began to wane. The historical references indicate that in the human history up to the New Age the economic relations were primarily circular. The materials, which were used for the productions of the various goods usually, found application in the composition of new goods, or were discarded, but they disintegrated due to their organic nature. Thus, for example, until the 20th century synthetic materials did not exist, which were non-degradable in nature. Because of the technological progress, in the middle of the 20th century there gradually emerged the linear economic model in which the raw materials were used for the production of goods, which were subsequently used until the end of their functional life when they turned into waste. Their dumping became necessary because it was not possible or difficult and not cost-effective to reuse the raw materials of which they were composed. Many dumping sites were made for this purpose. The increase of the accessibility to various materials, products and services facilitates people's life and contributes to the enhancement of their living standard in the European Union. The culture of consumption, however, leads to a number of consequences such as: increasing pressure on the output of natural resources, destruction of nature and aggravation of climate [7, p. 5].

Today most of the leading countries in the world are aware of the need to transfer from a linear to a circular economic model and consider the attainment of this goal as a priority in the applied policies of their economic development. First and foremost is the need for changes in the classical economic model, built on the logic of "take, make use and dispose", and the transfer to a cyclical model that corresponds better to the life system. The circular economy is the new trend that unites the economic growth and the protection of the environment. This is a model, based on the principles of eliminating waste and pollution, keeping the products and materials in use and restoring the natural systems and processes. It is not accidental that in the definition of circular

economy, provided by "Ellen MacArthur" Foundation, it is stated that it has the purpose of transforming the concept of "growth" by focusing on the positive benefits for the whole society by means of gradual separation of the economic activity from the consumption of limited resources and eliminating waste [11]. The three main principles on which the circular economy is based are: 1) Keeping materials in use; 2) Eliminating waste and pollution; 3) Regenerating and restoring natural systems and processes.

Consequently, the philosophy of the circular economy is based on the principle of the three R's: reduce, reuse and recycle.

On the basis of the concept of circular economy there emerge the ideas of the "green economy" [10] and the "blue economy", connected with the sustainable consumption and production. The green economy focuses on the chemical processes, and the blue economy is close to the physical natural processes. [8]

What has been pointed out so far is proof of the social significance of the topic of "circular economy". The history of the civilizational development shows that the important problems of societies always calls for a philosophical approach. The present report is an attempt for a philosophical interpretation of the circular economy.

Exposition

Ideas, connected with the circular economy as a means of being close to nature, can generally be found as early as ancient times, but they turned into leading philosophical ideas during the Enlightenment and the New Age through the French encyclopedians and Jan Jacques Rousseau's ideas of parenting and childhood education. Since the middle of the 20th century, following the wider spreading of the concept of circular economy, there have been certain attempts for philosophical interpretations of the concept, primarily at the level of the philosophy of science (bioethics, for example) and an analysis of the moral challenges confronting mankind, which it puts forth. One of the most popular philosophical analyses of the circular economy is again connected with the activities of the Roman club, with the publishing of the Report marking the 50-year anniversary of the club's foundation - „Come On! Capitalism, Short-termism, Population and the Destruction of the Planet“ (2018). In the report, the authors put forward the idea of the need for connecting the concept of the circular economy with the philosophy of balance, inspired by the Confucian cosmological principle of Yin and Yang, which will lead to a new economic logic as well [3, p. 115-116].

The main goal of the present report is to place the concept of the circular economy under the common denominator of the value-rationalistic (economic) approach. This is why we put forward the question; "How to consider the circular economy? As a value or as an interest?".

The main idea, which we put forward and support, is the following: the problems of the circular economy can and must be considered in the context of the philosophical dichotomy of value-interest, because, on the one hand, we can thus follow the logic in formulating and expressing the content of the "circular economy", whereas, on the other hand, we consider productive the movement of thought and analysis from the philosophical problem to the social and economic

reality of the circular economy. The latter is both a human value and a topic of global interest. Therefore, the analysis of the problem also requires a synergy between the axiological and economic approaches, rather than their confrontation.

The questions to which we seek an answer are the following: Is circular economy a value?; What kind of importance do we attach to it – national, regional, universal?; What interests does circular economy serve and/or impair?; In whose interest is the idea of circular economy?; Are there areas of conflict between the axiological and rational-economic dimensions of the circular economy?.

The analysis of the problems in this context firstly calls for a philosophical interpretation of the two main questions – “What is a value?” and “What is an interest?”.

What is a value?

The analysis of values is based on the following statements that are fundamental for philosophy:

First. The category of “value” is among the main philosophical categories. It is not accidental that it is interpreted along with the categories of “existence”, “consciousness”, “truth”. Based on the philosophical understanding of value, there arise the considerations of value as a social, political, economic category.

Second. The nature of values is neither only absolutely objective (ontological axiologism), nor is it only absolutely subjective (absolute subjectivism). It must be considered as a unity of subjectivity and objectivity, in other words, a unity of “the existence of value” and “the value of existence”. [4, p. 58] At the level of values, the objective and the subjective exist as related and mutually defining phenomena. Hence, the approach which is currently dominating in the philosophy of values is the one that considers them on the basis of “subject-object relations “. [4, p. 58]

Third. Values are implicitly related to (and are a result of) the human activity (in the sense of anthropic meaningful activity), because they are ideal phenomena, but at their basis lie also factors such as spiritual societal atmosphere, interpersonal communication (the profound contacts of I and the Other/Others, I and We), the spiritual aspirations and efforts of the subject to reveal his/her potential capacities etc. [6, p. 46-47]. It is in the activity that the meanings and values of/for the person are manifested and made clear. Through the activity values are objectivized (but not necessarily) in the social and cultural realities and thus are revealed to cognition; and when objectivized they acquire significance for the subjects. In the subject areas of the different social sciences, values are specified and verbalized, and in philosophy the value is a fundamental category which expresses the specifics of human existence and is determined as a subject-object” relation. [2, p. 67] In this context, it is important to emphasize that the carrier of values is not tantamount to the value itself.

Fourth. The nature of values is most distinctly manifested in a situation of choice of the subject – person, group, society, because in the philosophical meaning of the situation choice is a profoundly existential act (not merely a reflection of a specific and objective situation). Thus conceived, the choice requires not merely rational consideration, but rather an effort of the willpower and a personal reflection, it is in the “subjective reality”.

On the basis of the outlined highlights, we propose the following operative definition of values: they are ideal phenomena (notions, ideas, beliefs), a result of the anthropic meaningful political activity of man; they are historically formed and bear the specifics and peculiarities of the historical time and the political and economic systems. In the course of their existence, they are objectivized in concrete realities and thus acquire significance for the subjects. They are subject-object relations, expressing the characteristics of man as a social being.

What is an interest?

The interest is a starting category in the analysis of many and different problems – of the property and power relations, the rule of law and state governance, the social conflicts and the system of social ethics, the ideological concepts, the social and personal psychology etc. In the above-stated diversity of the social phenomena, the various characteristics of interest are manifested. All social structures and areas are related – as a source, reason and motive – to the interest. The specifics of the nature of interests is diversely manifested, but in it are always reflected the social activity of people, targeted at satisfying various everyday needs; the presence or absence of material and spiritual values; the real status and role of people or groups in the social hierarchy; the social identifications of people and groups; the social contradictions and conflicts; the potential and real visions of the organization and the state of the social existence.

The meaning and significance of the interest can be reduced to four “points of rest”, lying at the basis of the civilization development – work, cognition, understanding, communicating. [9, p. 54] The epistemological reasons for the interest can be sought in the subjective (personal or social) rationalization and commitment to theories, ideas and ideologies.

In the present report, we consider as a priority the definition of interests, formulated by G. Fotev: “The interest is an active, selective and intentional attitude of a subject (individual or collective/group) towards his/her approval or the approval of a social configuration which is considered to be more highly-placed” [5, p. 187].

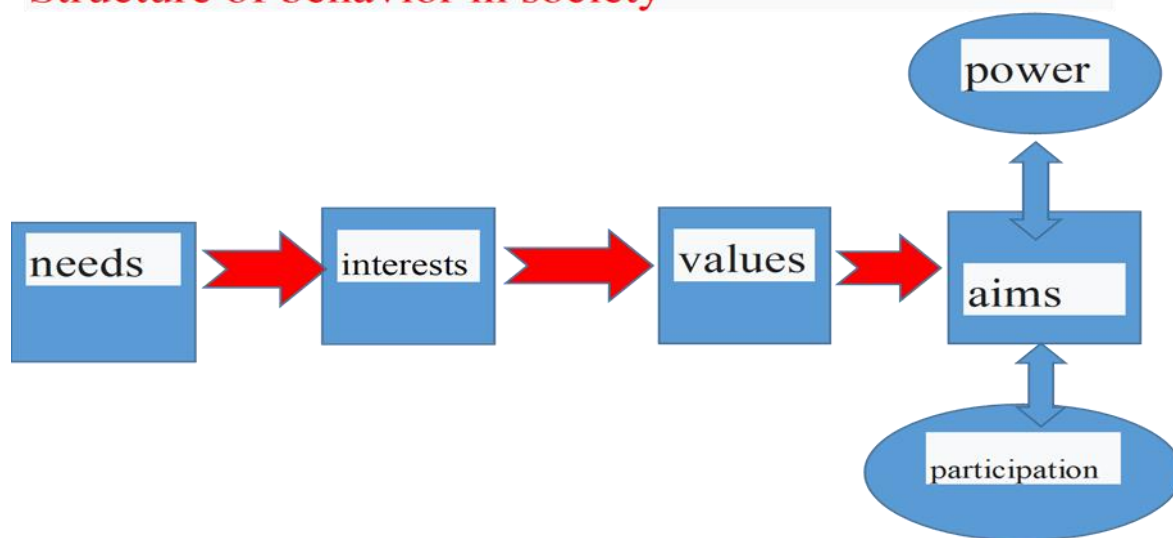
In the context of the differentiation between values and interest, the author points out the purposefulness of interests as their main characteristics: the purposefulness of interests is the key moment in the relation between values and interests” [5, p. 191]; “the interest is always intentional and the subject realizes and evaluates the purposefulness, especially with a view to the definition of the situation and the objective possibilities for achieving the goal” [5, p. 189].

From the above-cited definition, we can formulate the main characteristics of interest as a social category: (1) The interest is an attitude of a subject towards an object (or another subject); (2) The interest is an active, selective attitude; (3) The interest is a purposeful attitude; (4) The interest is a conscious attitude; (5) It is used for the satisfaction and gratification of needs, connected with the approval of the subject or targeted at social relations, satisfying the subject; (6) The interest is a fact of consciousness of the respective subject (a person, group, community); (7) The interest is at the basis of the individual or communal activity.

Therefore, the interest is a general theoretical category, expressing the structure of the social substance; an expression of the causality and need for keeping or reforming the social existence; a reflection of the real existence of people/groups in society.

The general philosophical understanding of values and interests, exposed above, will help the interpretation of the circular economy as a value and an interest. The analysis is based on the traditional logic, examining the structure of people's behavior in society: the objectively existing needs determine the interests; the latter are purported as values and are narrowed down to certain purposes; the accomplishment of the goals is bound to power (the presence/absence of power resources) and the participation of the carriers of needs in the process of fulfilling their interests and values – See Chart 1.

Structure of behavior in society



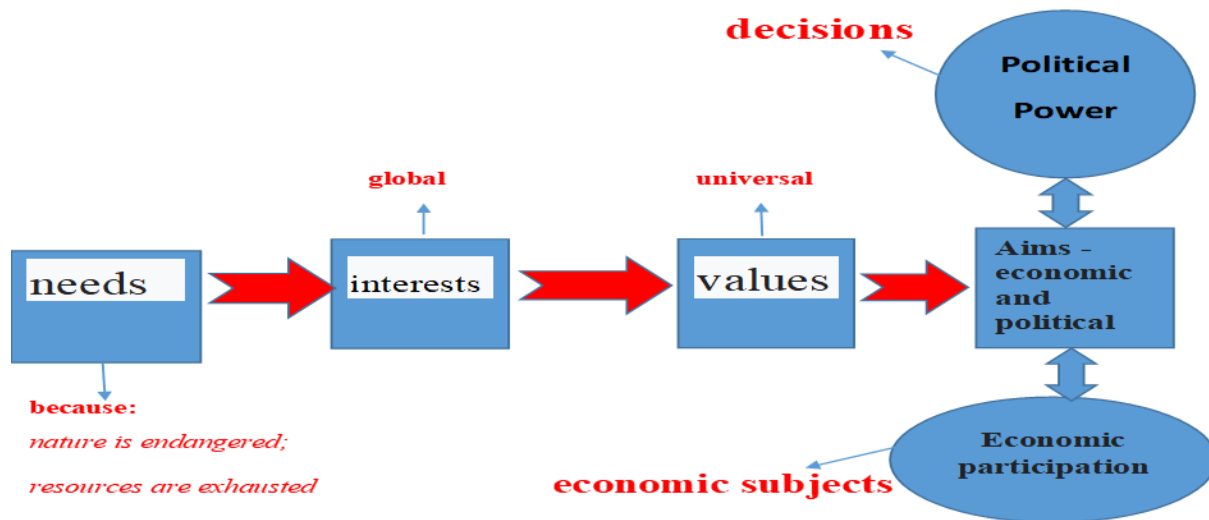
Source: author's chart

Proceeding from the above-indicated logic, we seek the place of the circular economy in the social process.

Where is the circular economy?

The circular economy, examined in the context of the dynamics of the social process, possesses the characteristics of a need, interest, value and goal. It is a need, because humankind is faced with global crises – ecological and a deficiency of resources – and this calls for a new economic logic, a new consumer and production behavior. Resolving the above-mentioned problems is in the interest of humankind as a whole. In other words, the transition to the model of circular economy is a global interest. The significance of imposing the circular economy as a dominating model makes it a universal value. Thus, the circular economy is becoming an economic and political value at an international and national level, which requires adequate political decisions from the institutions of political power and the participation of the economic subjects at all levels. See Chart 2.

Where is the circular economy?



Source: author's chart

Consequently, in answer to the question “Is circular economy a value or an interest?”, the logical conclusion is: the circular economy is a value which influences definite economic interests, connected with the production, consumption and profit; it calls for the imposition of a new economic logic which must be supported by political decisions.

Conclusion

The analysis of the circular economy with the terminology of fundamental dichotomies of the political philosophy – value – interest – makes the following conclusions essential:

The circular economy is both a human value and a global interest;

The analysis of the problems of the circular economy call for a synergy between the axiological and economic approaches, rather than their confrontation;

The analysis of the circular economy from the standpoint of the categories value-interest must be based on the philosophy of balance.

As a conclusion, it may be noted that the answer to the question “Is circular economy a value or an interest?” must be based on the disjunction, rather than on conjunction. The philosophy of confrontation must be replaced with the philosophy of balance. We use this expression concerning the circular economy, but this is actually one of the main ideas on the way to a sustainable and humane development, substantiated by the authors of the Report of the Roman club (2018). The authors call for the establishment of a balance between people and nature; the long-term and the short-term, velocity and stability, private and communal; men and women; equal placement and prizes for achievements; state and religion [3, p. 117-118].

We feel that in the analyses of the circular economy as well, it is necessary to seek and achieve unity, based on the philosophy of balance.

So, to the question of whether it is possible to apply the Confucian cosmological principle of Yin and Yang, the answer which we give is: Yes, it is possible and necessary!

The establishment of a balance between values and interests concerning the circular economy requires not only responsible political decisions – at an international and national level, but also a new type of education, forming a new type of consumer culture and the efforts of all agents of socialization – the family, educational institutions, media, civil organizations and movements. In all this lies the profound meaning of the call for a new type of Enlightenment in the 21st century, sent to the modern man by the intellectuals of the Roman club.

The essence of the philosophical type of thinking is manifested in putting forward questions. The eternal philosophical questions such as “Who am I?” and “What must I do?” have not lost their topicality even today, because modern man is again placed in a marginal situation concerning his future existence – his and that of the planet he lives on. The realization of this “marginal situation” and finding adequate forms of behavior is the way for us to preserve ourselves as a humankind. The concept of the circular economy is a possible solution to the global ecological problems. We believe that the philosophical interpretation of the circular economy is necessary for the modern theory and practice. In a certain sense, the philosophy is in debt concerning this set of problems. What is necessary are new philosophical analyses at the level of a philosophy of economics, ethics, philosophy of science, political philosophy, interpreting the concept of the circular economy, of its importance and role in the modern world.

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Evaluating Potential Financial Instruments to implement Circular Economy in Albania

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Abstract

This paper represents a descriptive analysis of different financial instruments alternatives that can support the transition from linear to circular economy model.

Through this study, we aim to answer some fundamental questions, as: what are costs and benefits of the circular economy model and what could be financial instruments that would support this initiative. Three basic rules of the circular economy '3R' (Reduce, Reuse, Recycle) are related with both economic agents: consumers and producers, while government involves on both sides and as a regulator. Regardless of the fact that there is room to work with both agents, it should start from the producer's side, since having products and services that are in accordance with the principles of the circular economy, bring a chain effect to the consumer to reduce consumption or allow reuse. Thus, the focus will be on the examination of the possibilities by the manufacturer. About 99% of Albanian businesses are SMEs, whose financing remains one of the systemic problems. Financial insufficiency becomes a hindering factor for investing in new production and consumption models aligned with recycling. To support economic agents, especially producers, i.e. the private sector, the state can intervenes as a promoter through some instruments that mitigate financial obstacles, via public finance instruments such as: tax relief, subsidies, green procurement and via private finance instruments, for example investments in the green economy.

In this study, an analysis of each of the above alternatives will be presented and the findings will serve as a set of recommendations.

Keywords: Circular, Economy, Financial instruments, Public, Private

Jel Code: K32, H23, F64

Context and Literature Review

The essence of economic science is the optimization of production factors which are limited and rare. Reduction and reuse actually means optimization of resources through substitution as different resources will be used to achieve the same goal and dematerialization using a smaller amount of a resource for the same function. The linear economy, which exposes the model of a linear cycle 'take-produce-dispose', is a thing of the past. Today, world economies are being driven by the circular economy model that results in reduction, reuse, recycling, renewal and regeneration. (Alfonso Aranda-Usón, 2019)

(Ozili, 2021) examined the benefit of circular economy towards the financial institutions and the role of the finance industry in the circular economy. He found that its benefit, particularly related to the banks, focuses to the: (i) more chances for the loan diversification; (ii) embeds accountable and supportable banking; (iii) enlarged lending to circular clients and the recycling sector due to the banks' profit for banks, and (iv) revising the bad perception about banks in society. Meanwhile, the benefits of financial institutions, except banks, focus to (i) issuance of special insurance policies for reused products; (ii) greater sustainability-adjusted return on investment; (iii) greater funding to microfinance institutions; and (iv) more opportunities for collaborative funding to circular businesses.

The three basic rules of the circular economy '3R' (Reduce, Reuse, Recycle) are related with both economic agents: consumers and producers.

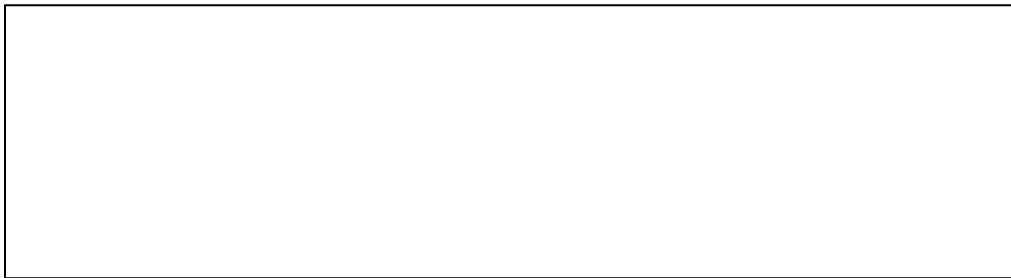
Nowadays, goods produced and offered should last longer or as long as possible, be easy to maintain, repairable and easy to disassemble and reuse, or to produce something that can be circulating from the beginning, using as few inputs and energy as possible, while ensuring at the same time that customers can have a real pleasure and real benefit from reusing and regenerating it.

Regardless of the fact that there is room to work with both economic agents, the starting point should be the producer, since products and services that are in accordance with the principles of the circular economy, bring a chain effect to the consumer to reduce consumption or that allows reuse. Thus, the focus will be on the examination of the possibilities by the manufacturer.

In the case of business and specifically of the private sector which dominates the market, about 99% of Albanian businesses are SMEs, and their financing remains one of the systemic problems in our market. Financial insufficiency becomes a hindering factor for investing in new production and consumption models.



(ASET, 2022) Like these initiatives in the international arena, there are also businesses in Albania that have adapted similar principles, such as:



The two examples above materialize cases where certain businesses from different production sectors have applied circulation principles from the need to optimize the resources used in

production, with the aim of minimizing economic losses. Presentations of such examples of success in our country can serve to make businesses aware of the importance of the circular model. However, awareness is at an early stage, in order for businesses to take concrete steps, it would be necessary for the philosophy of each business to identify the possible benefits that can result from adapted production processes.

In the following chapter, the costs and benefits of the circular economy model will be identified and what could be the financial instruments that would support this initiative in the productive sector. The reason for channeling only this economic agent is related to the fact that in this process more investment is required to change the production model. While in the case of the consumer, the implementation of the principles of the circular economy does not directly require additional financial resources.

Why Circular Economy

The Circular Economy itself is a systems solution framework that addresses global challenges such as climate change, biodiversity loss, waste and pollution. In our current economic model or otherwise the linear model, we take materials from the Earth, make products from them and eventually throw them away as waste - the process is linear. While in a circular economy, we will stop producing waste.

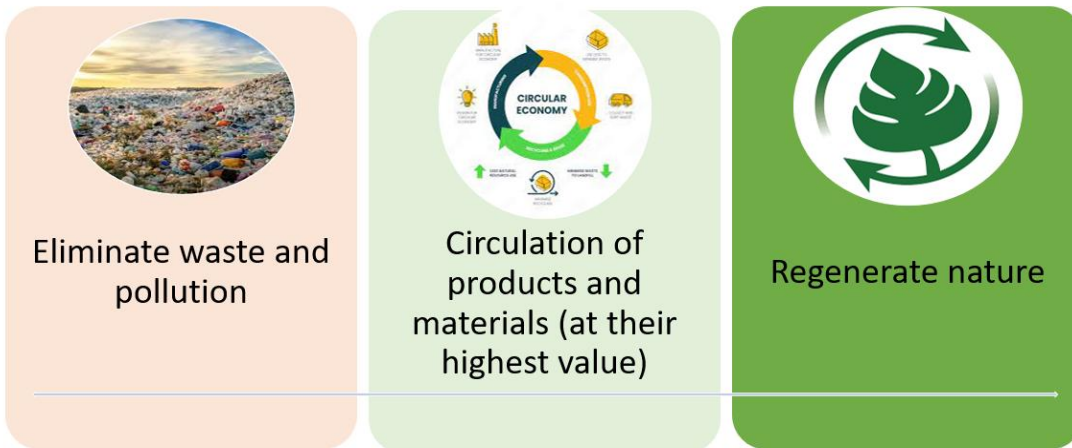
(Earth, 2022) According to a McKinsey study on the EU economy, the benefits of a circular economy could amount to as much as \$2.1 trillion USD—a 7% increase in GDP, generated from two components: (i) Savings on material costs and (ii) New innovation and job opportunities.

Savings on Material Costs-This lowers raw material and production resource requirements. According to the World Economic Forum, a circular economy could save the EU up to \$630 billion USD every year.

New Innovation and Job Opportunities-Transitioning to a circular economy sounds like it would come with a whole new set of problems—and it would, by eliminating current problems and finding new solutions.

The circular economy is based on three design-driven principles, as illustrated in the figure below:

Figure 1: Circular Economy ‘Principles



Source: Author's visualizations

Eliminate waste and pollution- A circular economy identifies and plans solutions to the adverse effects of economic activity that harm human health and the environment. This includes structurally generated waste, such as traffic congestion, as well as the emission of greenhouse gases and hazardous compounds, as well as air, land and water pollution.

Circulation of products- It means that by keeping products and materials in use. This means designing for sustainability, reusing, reproducing and recycling to keep products, components and materials circulating in the economy. Circular systems make effective use of bio-based materials by encouraging many different uses for them as they circulate between the economy and natural systems.

Regenerate Nature or natural systems- A circular economy avoids the use of non-renewable resources and preserves or enhances renewable ones, for instance by using renewable energy as opposed to relying on fossil fuels.

According to (Ruthie Bowles, 2021), the global economy is only 8.6% circular as of 2021, down from 9.1% in 2019.

Relevance of Circular Economy adoption, strongly relates also to climate-related issues. The circular economy focuses on designing no-waste products, using products as long as possible and preserving or enhancing renewable resources. (Foundation, 2021)) has estimated that if a circular approach were adopted in just five sectors (steel, aluminum, cement, plastics and food), annual GHG emissions would fall by 9.3 billion tons of CO₂ in 2050 which is equivalent to the reduction that could be achieved by eliminating all transport emissions globally. In this way, the circular economy can play an important role in managing climate-related risks that have become very current concerns.

The benefits of CE are visible at the global level, but the challenge is to boost the private sector to switch to a new business model that applies a circular economy in production. It should be analyzed and worked to make businesses aware of why business should follow a circular economic model. This can be achieved if in the analysis of decision-making from the business point of view, the costs and possible benefits of the application of the circular economy are first compared. In the following, the analysis of the costs will focus on the identification of mainly financial resources to cover the costs.

Adopting circular strategies has huge benefits for businesses, both established and new. Mature companies can reduce their exposure to volatile virgin resource markets, while startups can seize opportunities to fill demand for new services that keep products in use longer. Whether the business is old or new, it can directly benefit from a circular economy in two major ways: (i) Less reliance on raw materials, and (ii) New revenue streams.

Reduced reliance on raw materials- Extracting raw materials is a volatile market often affected by country politics and natural disasters. In the EU, current recycling and waste recovery efforts save only about 5% of the entire raw material value. Circular business models reduce exposure to raw material volatility through reuse, remanufacturing, refurbishing and recycling.

New Streams of Profit - Adopting circular business strategies will not be easy and companies will have to innovate through the challenge. New revenues are likely to come through new services that support the circular economy transition.

Measures and Financial Instruments for adopting CE

One of the main obstacles that hinders CE implementation is the limitation of financial sources. Private sector, due to the lack of finances have not been focused to invest in circular model. Therefore, a financial supporting of the sector might incent the businesses to start applying circular model in the production cycle. Either public nor private finance instruments may boost the investment toward circular model.

Efforts to mitigate pollution imitated decades ago ‘the Pigouvian tax’, named after 1920 British economist Arthur C. Pigou, is a tax on a market transaction that creates a negative externality, or an additional cost, born by individuals not directly involved in the transaction. This tax is a fee paid by the polluter per unit of pollution, and is set to be exactly equal to the aggregate marginal damage caused by the pollution. As well ‘Pigouvian Subsidy’, where a subsidy is levied per unit of abatement of the externality. (Economist, 2022)

If we look at the possible measures that a country can apply to implement CE, they are categorized into 3 types: stick, carrot and sermon. (SER)

The stick stands for discouraging polluting activities by absorbing environmental costs. Environmental taxes, levies, emissions trading systems, the setting and raising of standards, as well as regulations and prohibitions, are the most well-known examples of such measures. Fines can be imposed for violations of the established rules. By applying penalties/fines for companies that contravene environmental and CE policies might push them to mitigate their natural externalities.

The carrot tempts producers or consumers to adopt the desired environmentally friendly behavior. Subsidies, tax exemptions, price concessions, guarantees and credit facilities, but also preferential treatment through tenders and facilitating the development of knowledge and innovation policies are part of the repertoire of measures based on the carrot approach.

Finally, *the sermon* responds to standards and values and relates to the information and communication side of the policy mix. By informing producers and consumers about the consequences of their purchase and user behavior, it is possible to encourage them to adopt socially desirable behavior.

In the following we will identify measures according to the implementing authority and evaluate for each case how they stand in Albania and what are the potentials for the implementation of the measures.

3.1 Public instruments

The public instruments that financially support the promotion of CE applicability are presented below:

Tax reduction/exemptions- By applying tax incentives for companies that start to pilot the application of production/providing methods in accordance with the principles of CE. as a result, there will be missing income in the budget, which must be replaced with other tax items. *It is not applicable in our country.*

Subsidizes- Providing subsidization of the costs of companies that apply pro-CE methods. *It is not a policy implemented in our country.*

Initiation of awareness and sensitizing measure- a measure without direct financial impact, but can influence by indirectly stimulating businesses to see the application of EC as an investment alternative that will be accompanied by financial returns. *At earlier steps in our country. More than 500 000 Euro has been planned in MTBP 2023-2025 for the output Circular Economy which is financed through IPA 3.*

Indirectly, the application of **Green Procurement policies** can also influence. Green Public Procurement (GPP) has a significant role in fostering circular economy at local and central levels by purchasing goods and services that help to develop a more sustainable production and consumption without causing harm to environment. *It is not applicable in our country.*

Above, it is shown that out Albania has not worked yet with carrot measures. But in the other side, (INSTAT, 2020) it has applied for years several ‘stick’ measures, in specific: tax on energy, on transport, pollution and on natural resources. Environmental taxes are considered as an economic instrument to control pollution and manage natural resources and they are designed to influence the behavior of businesses, producers and consumers.

1. Energy taxes (including car fuel) include taxes on energy production in the country, as well as energy production that is also used for transportation purposes. This includes taxes on bio-fuels and other forms of energy from renewable sources, as well as taxes on reserves of energy products.

2. Transport taxes (with the exception of car fuel) mainly refer to taxes related to the ownership and use of vehicles. These taxes include taxes on other means of transport (such as planes, ships and trains, etc.) and their services.

3. Pollution taxes include emissions measured in air and discharges into water, management of solid waste and noise, etc. Excluded here is the CO2 emission tax, which is covered by the energy tax category.

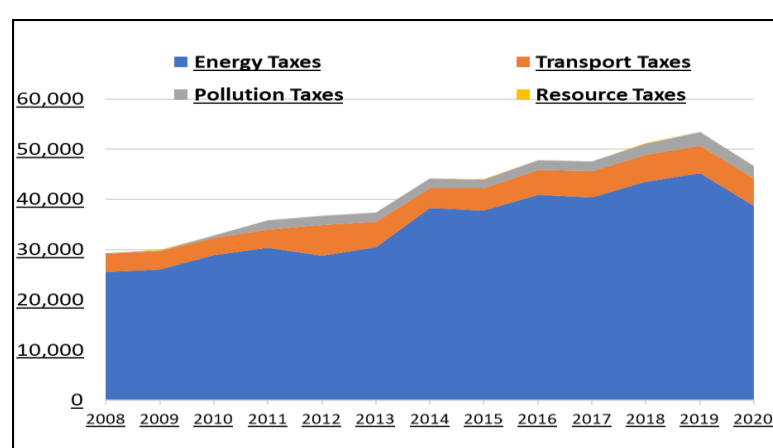
4. Natural resource taxes include taxes for extracting or using natural resources (water, forests, wild animals, etc.).

Table 1: Income collected from environmental taxes (in million ALL), 2008-2020

Description	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Energy Taxes	25,479	25,981	28,865	30,353	28,789	30,479	38,341	37,741	40,946	40,400	43,522	45,165
Transport Taxes	3,620	3,715	3,385	3,580	6,078	5,040	3,863	4,437	4,936	5,145	5,342	5,567
Pollution Taxes	159	174	542	1,848	1,878	1,853	1,889	1,782	1,880	1,941	2,226	2,625
Resource Taxes	21	18	17	15	19	21	26	33	52	62	56	59
Total	29,278	29,888	32,809	35,796	36,764	37,393	44,119	43,993	47,813	47,549	51,146	53,416

Source of info: INSTAT (2022)

Fig 1: Environmental tax revenues, by type of taxes

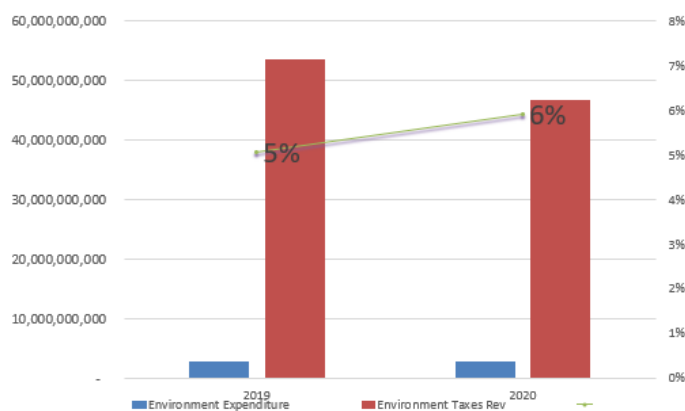


Source of info: INSTAT (2022)

The weight of income from environmental taxes to the Gross Domestic Product (GDP) ranges from 2.5-3% or almost 12 % of tax revenue and social contributions.

Albania has not mobilized yet public financial resources to take prevention measures that support circularity. (Economy, 2021) Only component where our country is mobilizing public funds is to manage Waste, as: Waste which is managed under the auspices of local government bodies, financed as services from their budget for local residents and other residents in their administrative.

Table 2: Public financial potential: Ratio of environment expenditure in term of environment tax revenues

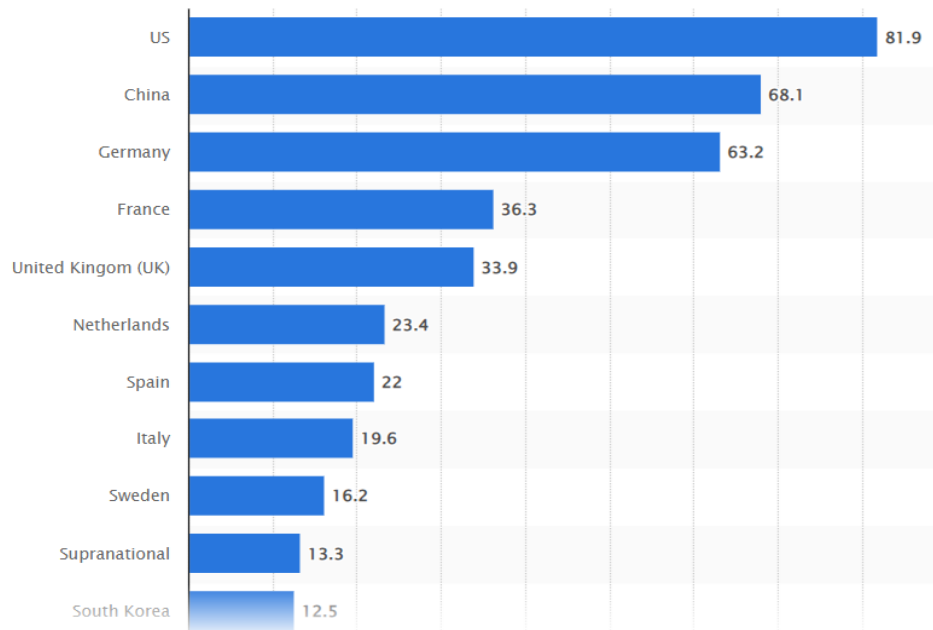


Source: MoFE (2022)

3.2 Private Instruments

Transitioning to a circular economy not **only addresses the negative impacts of the linear economy**, but more importantly it represents a systemic shift that builds long-term resilience, **generates business and economic opportunities**, and provides environmental and societal benefits. The financial sector has gradually been adopting circular economy approaches through different private financial mechanisms over the last two years. These include circular economy-themed ‘green bonds’, and other financial instruments, as well as the use by investment fund managers of the circular economy as an approach to thematic investing. Green bonds raise funds for new and existing projects which deliver environmental benefits, and a more sustainable economy. ‘Green’ can include renewable energy, sustainable resource use, conservation, clean transportation and adaptation to climate change. Other financial instruments (Bank & NBFIs) are: Increased lending to circular clients and the recycling sector as an approach to thematic investing; Insurance companies can create special insurance policies for reused products etc.

Table 3: Leading countries in terms of green bonds issued in 2021, in bln \$



Source of information: (Statista, 2022)

3.3 Mixed finance

PPP and concessions. Concessional finance are lines of credit that can help to scale up circular economy finance. In Albania is very used for incinerators. This new waste management policy has also been criticized in the 2018 progress report of the European Union, stating that: (Vendore, 2022) "The construction of the incinerator in Elbasan, which started operating last year and plans for further investment in incinerators pose a concern in terms of compliance with EU principles, as landfilling and incineration are the least popular waste management options". (Albania, 2022)

4. Conclusions

Measures to adopt circular economy are: Stick (tax, penalty/fines), Carrot (Subsidies, tax reduction/exemptions, price concessions, guarantees and credit facilities) and Sermon (awareness).

No 'carrot measures' have been used or implemented up to now in Albania.

Only 'stick' measures, such as: tax on energy, on transport, pollution and on natural resources

Private finances of business limited. 99% of businesses are SMEs, which suffers continually from limited finances. Concessional finance is lines of credit or instrument that is very used in Albania for incinerators.

Potential public finance present in Albania: only 6% of Tax environment income are used for Environment Protection.

New tax incentive: Tax reduction for recycled products, i.e. differentiate VAT between new products and materials, and circular ones.

Potential private finance instruments: main source such as Green Bonds- depends on capital market development (not much developed in our country). No green bond issued in Albania.

Bank and NBFIs may play a greater role in financing circularity and at the same time benefiting by supporting these activities.

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Forecasting Real GDP Growth in Albania: Considering ML Models as an Alternative

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Abstract

Gross domestic product (GDP) is crucial for estimating the performance of an economy. It gives policymakers the ability to understand whether the economy of a country is going to expand or contract, and enables them to apply the right monetary policy. This study focuses on one-step ahead forecasting for the quarterly real GDP growth of Albania.

In this paper, we have done a comparison between different machine learning tools, used for GDP forecasting, and traditional methods. Artificial intelligence is evolving and is rapidly entering our society, hence economic forecasting is no exception. In the real world of business, AI has been used considerably for economic forecasting, but few are the studies focused on machine learning. In this paper, we make a comprehensive comparison of the forecasting accuracy of Gross Domestic Product (GDP) using the Machine Learning algorithms and the traditional ARIMA time series regression model in the economy of Albania.

The result of the paper shows that ML algorithms can be seen as a comparative tool on GDP forecasting and encourages the use of different ML models in macroeconomic forecasting.

JEL Code: C22, C24, C14, C45, E27.

Keywords: KNN, LSTM, GDP, Forecasting, Univariate

Introduction

The economy has been dealing with forecasting problems for a long time. According to Camba-Mendez, Kapetanios, Smith & Martin (2001) the demand for forecasts of key economic variables remains stronger than ever. According to them the use of machine learning algorithms in forecasting macroeconomic variables is a relatively new and growing field.

Real Gross Domestic Product (GDP) is a single, comprehensive measure of economic activity that takes into account the total value of goods and services produced in the economy. It is considered by academics, investors and regulators as an indicator of the wealth of the economy and an informative indicator that guides decision-making processes (Provost & Fawcett, 2013).

Policymakers need to gain more context about the present economy circumstances in order to make ideal policy decisions. According to Premraj (2019), these decisions are often made in uncertainty not only about future economic conditions, but also about the current economic situation.

In light of the recent crises in the economy around the world, the issue of forecasting the Gross Domestic Product (GDP) is much debated. Policy makers sometimes have to make choices on the fly and are often found to be wrong due to a lack of knowledge about the latest economy trends in their country. (Cicceri, Inserra, & Limosani, 2020).

Artificial Intelligence is beginning to change our society and the traditional field of economics. Stock prices, exchange rates and so on are now predicted using AI, especially in the real world of business (Kurihara & Fukushima, 2019).

On the other hand, ML is a part of artificial intelligence and also, Martin (2019) points out that machine learning is applied in branches of statistics that involves the usage of a wide range of tools that can assist to better understand data, usually for prediction purposes. Machine learning's ability to use large data sets to determine a generalizing model is what makes it an attractive technique.

Machine Learning according to Premraj (2019) is a subgroup of artificial intelligence (AI) that provides systems of algorithms and statistical models that perform specific tasks. He emphasizes that the main advantage of ML algorithms is that they rely on the relationships and patterns they identify while also having the ability to incorporate a large amount of data (Vika & Vika 2021). He points out that this particular feature makes ML methods well suited to learning the underlying, complex structure of data and using this to make predictions about future values (Premraj, 2019).

Methodologies

The time series of Albania's real GDP study starts from the first quarter of 1996 to the first quarter of 2022. After that, we measure the forecasting accuracy of each model by calculating the Root Mean Square Error (RMSE), Mean Absolute Error (MAE) and Mean Absolute Percentage Error (MAPE). We use a recursive strategy to forecast in which only one instance of each model was estimated and used to iterate on the forecasting horizon until we reach the horizon we want.

In this paper we compare three different models: the univariate ARIMA, which is the traditional method, the K-Nearest Neighbor (KNN) algorithm, and the Long Short-Term Memory (LSTM) model. The KNN and LSTM are supervised machine learning methods used for different kind of problems. They have recently been applied on time series forecasting. By R software, the analysis will be performed and the results will be extracted. In the R program, we used the *tsfknn* package that allows the prediction of a time series using KNN regression. For the LSTM model was used Tensorflow library in python.

ARIMA modeling

A well-known and widely used statistical method for time series forecasting is the ARIMA model. The ARIMA model is a generalization of a simple autoregressive moving average. ARIMA is an acronym that stands for Autoregressive Integrated Moving Average.

According to Muçaj R. (2018) ARIMA models are one of the most used time series models. The popularity of ARIMA models comes as a result of their statistical characteristics as well as the well-known Box-Jenkins methodology in the process of building the model. Moreover, it is said that many different models can be modeled by ARIMA models (Muçaj, 2018).

Although ARIMA models are flexible, in the sense that they can model different types of time series, predict accurately in a short period of time, and present simplicity of implementation, their biggest drawback is linearity. ARIMA models assume that future values of a time series have a linear relationship with past values and white noise, so approximations from ARIMA models are not suitable for complex nonlinear problems (Muçaj, 2018). The ARIMA model offers very little economic logic, future predictions are formed exclusively from the information contained on past movements and forecast errors. But, regardless of the way these models forecast, it was widely demonstrated that they often outperform multivariate model predictions.

An ARIMA model was compound by three parameters: p , d , and q where:

p – the number of lag observations in the model

q -- the size of the MA window

d -- the number of differencing required to make the time series stationary

Machine Learning modeling

New forecasting methods have been invented by the field of AI. Policy authorities and market participants have investigated about how AI would be useful or how AI should be used for economic activities (Kurihara & Fukushima, 2019).

Machine Learning is the part of artificial intelligence that allows software applications to predict outcomes accurately without being explicitly programmed, and its algorithms use historical data as input to predict new output values (Vika et al. 2016). It focuses on building systems that learn or improve performance based on the data they consume.

Even though many of these algorithms have been around since the 1970s, the field of Machine Learning has only gained significant attention in the last decade. This is mainly due to the fact that powerful low-cost computing and increasing data volumes have only recently become accessible to the vast majority of people. The selected ML algorithms of BART, GLMNET, GBM and XGBoost have given promising results in a wide range of fields such as healthcare industry, retail trade and financial industry. It is therefore interesting to use these algorithms in GDP forecasting (Premraj, 2019).

Kurihara & Fukushima (2019) notes that Machine Learning is closely related to deep learning. Deep learning is invented from information processing patterns or communication patterns in

human nervous systems. Deep learning structures such as recurrent neural networks have been used in many ways, including economics (Kurihara & Fukushima, 2019).

In this paper, we apply the KNN algorithm and LSTM model to predict time series. Both, the KNN algorithm and LSTM are machine learning tools useful for solving classification and regression problems based on analogy learning. Richardson, Mulder, & Vehbi (2018) points out that KNN is a widely used non-parametric method that uses a distance function to measure the similarity between data used for training and testing purposes.

KNN algorithm

The K-Nearest Neighbor algorithm is based on a supervised learning technique and is a non-parametric algorithm, which means that it does not need any prior assumption on the data. This algorithm uses similarity to predict the values of any new data points.

The data set is split in the training and testing set. KNN algorithm does not have a real training phase, the entire data are kept in memory and used during the prediction. The KNN algorithm learn and get tested on the parameters used in testing phase.

In order to build the model, we need to specify the k parameter, which is the number of the nearest neighbors to be selected in each step, and also, the method to be used for the calculation of the distance between the new point and each training point.

LSTM model

The Long short-term memory (LSTM) is an artificial recurrent neural network (RNN) that can store information for a certain period of time. In consequence, the LSTM model are very useful when dealing time-series data.

A recurrent LSTM unit maintains information that it has seen previous from past data and ignores irrelevant information through a vector called an 'internal cell state'. In order to do this, the structure of the LSTM has different layers with activation functions called 'gates' for different purposes. Four are the types of gates on a LSTM unit:

The first one, the input gate, is used to add significant information to the neuron. The second one is the forget gate, which eliminates information that is no longer relevant in the present neuron state. Then we have part of the input gate, the input modulation gate, which is used to modulate the information that the input gate will store inside the internal state cell by adding non-linearity to the information and normalizing it. The last one is the output gate, part of the last layer, that defines what output to generate from the current internal cell state.

Data

In our empirical study, we study the performance in forecasting real GDP values in Albania with the help of monthly macroeconomic and financial variables. For our research, we use macroeconomic data provided by the Bank of Albania database. The database includes real Gross Domestic Product. The sample period is from the first quarter of 1996 to the first quarter of 2022. Quarterly data are used for estimation.

In this paper we have made a comparison between the ARIMA method with two most popular machine learning algorithms (KNN algorithm and LSTM), where we have studied another economic variable such as real GDP, for the period 1996 - 2022 in Albania. The data set is divided on training set and testing set. The period from the first quarter of 2009 to the first quarter of 2022 is used for the testing phase.

The study uses the R program to make a comparison between traditional and machine learning methods for analyzing and forecasting Albania's GDP. R is well suited for statistical programming and there are useful packages available online to aid the process, and reduce the amount of pre-coding that will need to be done. The dataset we used contains a total of 105 observations. For the estimation of LSTM models, we have used the *tensorflow* library in python. The variable that we will study and predict is the real Gross Domestic Product for the case of Albania.

Gross Domestic Product represents the economic health of a country. It represents an amount of a country's output that consists of all purchases of goods and services produced by a country and services used by individuals, firms, foreigners and government bodies (Önde, Bayır, & Hepşen, 2013).

Forecasting Results

In practice, we estimated numerous ARIMA forms, which were constantly tested for normal distribution, serial correlation and heteroskedasticity in the residual. The structure of our selected model is ARIMA (3,1,0) (0,1,0).

The structure of the LSTM model trained to forecast one-step ahead has 3 lagged data observation as input, 5 hidden LSTM layers with different number of nodes in each of them. The optimization algorithm used is Adam and the learning rate is 0.001.

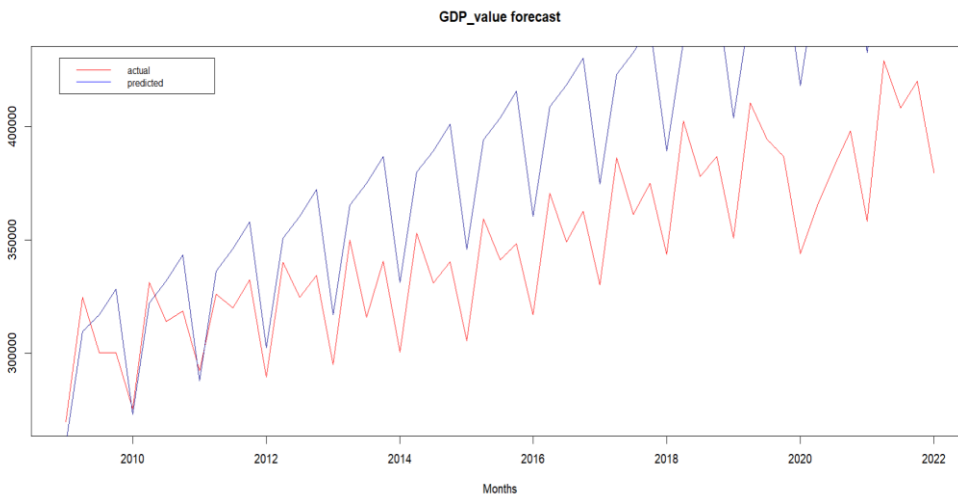
Table 1: Results of ARIMA, KNN and LSTM models

	ARIMA model	KNN model	LSTM model
RMSE	52839	34895	27288
MAE	46029	29693	22484
MAPE	12.87	8.36	6.48

Source: authors (2022)

Table 1 presents the estimation results of the out-of-sample forecast errors for each of the models: ARIMA model, the KNN algorithm and LSTM model. We see that the RMSE value measured with the LSTM model surpass the KNN algorithm with 34895, and also the ARIMA model which is 52521, this value is smaller. Also, we see that the MAE and MAPE value of the LSTM model is smaller.

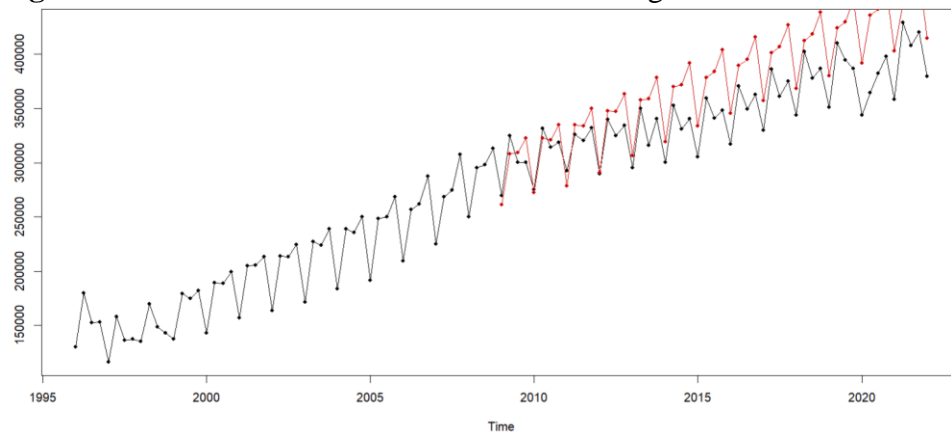
Figure 1: GDP forecast with ARIMA method from 2009 Q1– 2022 Q1



Source: authors (2022)

In figure 1 we graphically presented the current values of real GDP measured with the ARIMA model which are presented in red and the predicted values of GDP which are presented in blue.

Figure 2: GDP forecast with KNN algorithm from 2009 Q1 – 2022 Q1

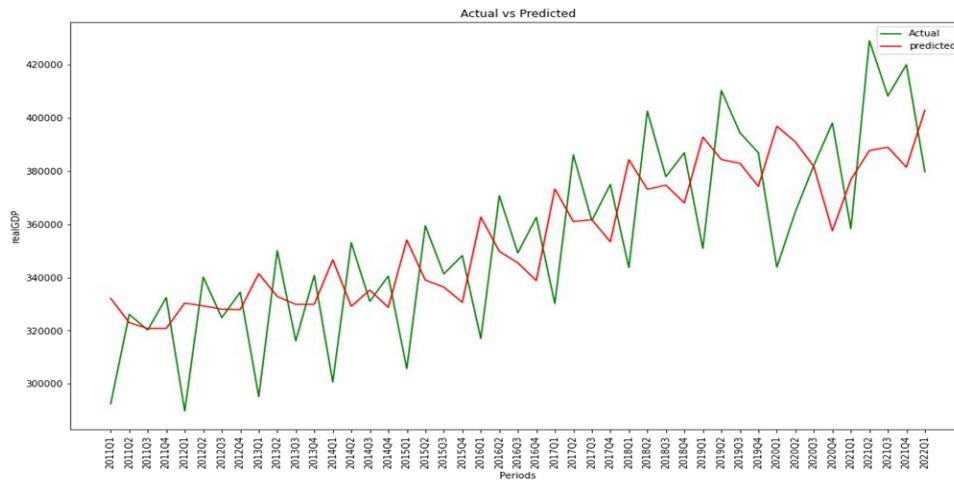


Source: authors (2022)

Figure 2 shows the current GDP values measured with the KNN algorithm for the period from the first quarter of 2009 to the first quarter of 2022. Even from the graphic presentation, we see that the predicted values are very close to the real ones.

Also, in the below figure, figure 3., we show graphically the comparison of predicted value with LSTM model against the actual value for the testing periods interval.

Figure 3: GDP forecast with LSTM model from 2009 Q1 – 2022 Q1



Source: authors (2022)

When we compare the results of accuracy measures such as RMSE or MAPE, we can easily see that the ML models are much better than the ARIMA model for our time series. The ML models have the lowest values (RMSE, MAE, MAPE) of all the forecasting methods and it is clear from the graph that the forecast based on the ML models is closer to the actual values. So, the prediction with the ML models compared to the ARIMA model are closer to the actual values.

Figure 4: GDP forecast from Q2 2022 – 2025 Q4, ARIMA model

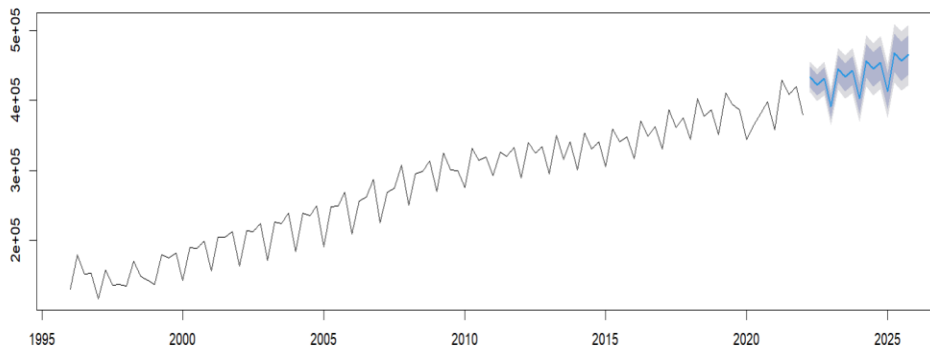
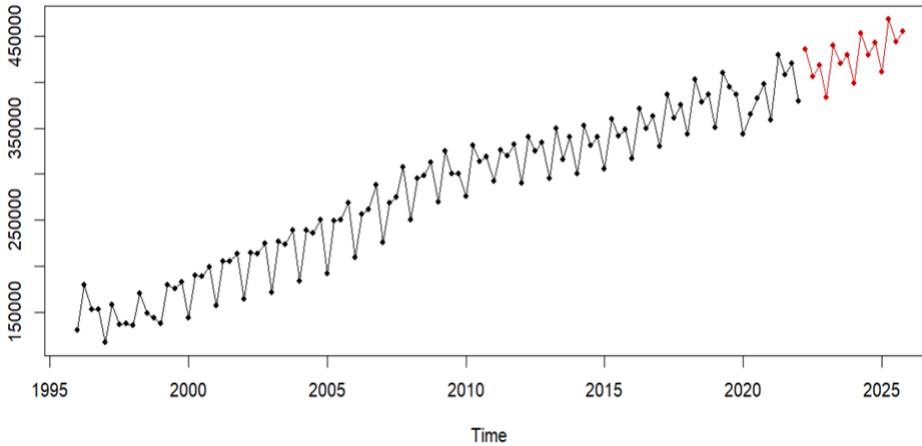


Figure 5: GDP forecast by KNN from Q2 2022– 2025 Q4



Source: authors (2022)

Figures 4 and 5 show graphically the predicted values for the following years. The predicted values include the period from the second quarter of 2022 to the fourth quarter of 2025. As can be seen from the graphs, the predicted values follow the trend and seasonality of the real GDP series.

Concluding Remarks

This article adds value to machine learning literature by giving evidence of how potent and useful they can be as a tool in the process of economic and financial decision-making. We confirm it, by applying different ML models on the prediction of the real GDP. In terms of model performance, considering the out-of-sample forecasting ability, the results of the experiments show that the machine learning models perform better than the ARIMA model.

The results of this study show that in our case the best model to be used is the one using machine learning methods. Further the research can be extended by studying the real GDP prediction based on economic fundamentals as well as dynamic forecasts.

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Circular Economy and its implementation tools

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Abstract

Circular Economy (CE) is a concept where the attention of the researchers and practitioners is focused. The awareness for the growing population, the misuse of limited natural resources, climate change and the domino effect that proceeds, have influenced the countries to place objectives and make decisions. The placement of the AGENDA 2030 and the 17 Sustainable Development Goals (SDGs) are an effort of the United Nations (UN), where all the countries are engaged. Albania is one of them and it is imperative for us to do our duties and take action. In order to advance in the path to achieve these objectives, it is important to define action plans with the circular economy being a crucial component of these plans.

This paper is a literature review on the concept of CE, the challenges and barriers in application. The implementation tools the research offers are considered as suggestions for businesses to reflect on their business models (BMs), to totally change or to modify them. The CE must be acknowledged as an opportunity for the businesses to adapt to the changes in the global environment, but also to improve their core values. The paper is useful as it realizes an examination of the research on CE and offers archetypes to be integrated in the Albanian organizations. As most of Albanian businesses are in the category Small and Medium Size Enterprise (SME), the difficulties SMSs face in implementing the circular concept are to be recognized and to be taken into consideration. This can be recognized as a guidance for the Albanian businesses to circularity.

Keywords: Circular economy, innovation, business modelling, BM patterns, SMEs

Jel Code: M13, L29, Q01

1. Introduction

From the moment Albania moved to a free market and especially nowadays that it pretends to enter the European Union, it is imperative to think about sustainable practices and circular concept. With its engagement at AGENDA 2030 for doing steps forward in achieving the 17 SDGs, Albania is committed to work, among others, on sustainability. It is important to consider concepts in the three levels (Ghisellini et al., 2016) as in the macro level it is the state with its strategy that creates the proper environment for implementation, but there is also the micro level which considers implementation of circular concepts in the individual organizations. This paper gives an overview of the concepts of CE and sustainable BMs, with the focus then on tools and methods for implementation in the business. After a search process on Google Scholar, relevant articles are chosen for the goal of the analysis. A flowchart clarifies the steps of the research process. As businesses make most of the supply of products and services in the market, it is important for them to lead their businesses towards business models that consider circularity. The analysis of barriers businesses go through, especially SMEs, is very important in order for them to find the proper strategies to eliminate or relieve the barriers. A tool that is mentioned a lot in management is creating scenarios. It seems the same also here. It is very important for businesses to go through experimenting as in practice is not that simple as copy/paste. An approach may have been very successful for a business but may not seem such for another business. Taking the risk of experimenting and considering the innovation process may lead to a good implementation process. The tools offered in this paper may be used by the business for their experimentation.

2. Literature review

The concept of CE is of high priority for all countries, especially nowadays when there is a very large fluctuation in prices and shortage in the availability of resources (Pawlak & Kołodziejczak, 2020), partly generated by the conflict in Ukraine. CE aims to provide opportunities by creating a new way of business thinking, opportunities for work and a more productive usage of resources while achieving a minimal impact on the environment (Preston, 2012). CE focuses on using resources to meet current needs and wants, while thinking about the availability of resources for future generations because it aims to eliminate waste, circulate resources, and regenerate nature⁷. To accomplish this, it is required that companies undertake specific strategies for applying circular concepts in their internal systems (Bocken et al., 2013). On the other hand, it is important the organization is understood as an element of the whole system; therefore, it is essential to create collaborations in the value chain (Bocken & Konietzko, 2022). As the organization is an open

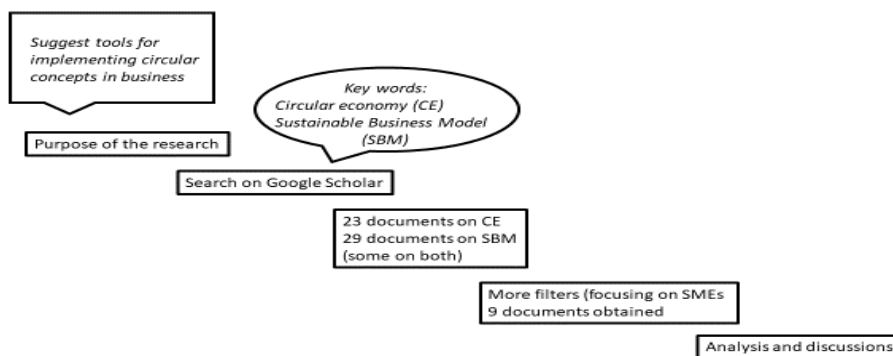
⁷ Ellen MacArthur Foundation, Circular Economy Introduction, available at <https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview>

system, it is essential not to think of it as detached from the entire system. The concept of CE in the organization is included in its internal processes with the relevant strategies, and also to the consumer who is definitely part of the chain in the closed loop of the circular economy, and finally in the whole society. Therefore in literature two main orientations are distinguished in the implementation of CE (Kalmykova et al., 2018): a) implementation in the entire economy and b) implementation at a narrow level considering products, materials and raw materials. Furthermore Ghisellini et al., 2016 proposes the study and implementation at three levels: micro level (business and consumer), meso level (eco-industrial parks) and macro level (city, district and state). In continuation of the engagement of the states in the AGENDA 2030, each of them must define binding or guiding policies for the entire state⁸. EU proposes that companies use Product and organization Environmental Footprint Methods (European Commission. Directorate General for Environment. et al., 2021) as part of related initiatives for providing models for sustainability in products, services, and BMs. This is because World Economic Forum (2021) presents that the element that plays a key role in the economy and in relations between countries, are the materials.

3. Tools and methodology

This paper is a systematic literature review with the aim to identify relevant research that was realized with the focus on circular economy and sustainable business models. For the purpose of the investigation, a search on google scholar was conducted with the related keywords and a time period of ten years was taken into consideration. The flowchart of the process is depicted in Figure 1.

Figure 1. Flowchart for the research process



⁸ More information on “The Sustainable Development Goals Report 2022” at <https://unstats.un.org/sdgs/report/2022/>

Research realized prior to this period, if it is considered important, was included in the study. All the articles that had dealt with circular economy and/or sustainable business models have been selected for analysis. Further filters for SMEs has been used in order to select all those articles that had in their focus SMEs as most of the Albanian businesses is in this category. In the case any paper was not open accessed, different connections in order to access the needed materials were utilized. The aim was to build up on significant research, to find suitable tools for implementation in the existing businesses in Albania and to pinpoint the difficulties that the businesses come across. This would serve the business for going through a smooth change process towards sustainability. It may also serve as a foundation for empirical research.

4. The path to circularity

In order for the companies to implement circularity concepts, they need to go through innovation of the BM in order to find new solutions to sustainability issues, to focus on retaining resources and to have positive influence on environment and society (Bocken & Konietzko, 2022). Innovation gives new ideas for implementation in the practice. Innovation can come in three levels (Fagerberg, 2013): in the micro level (thinking of innovation in the organization), in the meso level (thinking of innovation in the interrelationships between different actors – the innovation system) and the macro level (thinking of the consequences that innovation has on the social and economic field). The more diffused type of innovation is technological innovation, but there is also organizational innovation. The first has to do with technological inventions like products, services or processes while the organizational innovations deal with changes happening inside the company such as strategy (Dionizi, 2017). Chaminade, 2020 suggests that our intention to implement strong or weak sustainability (Davies, 2013) is in relation to the kind of innovation happening in the company. In order for innovation to happen, no matter what kind it is, it is important to have creativity in the organizations and mainly in people as innovation comes from people. It is not something to order and implement. Creativity needs to be nourished in the working environment with the proper tools like organizational encouragement, challenge works, encouraging people and team work and empowering people (Dionizi, 2017). As a consequence the innovative approaches can contribute to circularity through the business model innovation (Baldassarre et al., 2017; Bocken et al., 2014; Evans et al., 2017).

5. The specifics in the implementation of the circular concept

It is a worldwide trend to move from a linear economy with a produce-use-waste model to a circular economy with a produce-use-circulate model. But while strategies for applying circular concepts are required, techniques and criteria for measuring the degree of circularity at three levels are often missing (Elia et al., 2017; Ghisellini et al., 2016; Haas et al., 2015). Ritzen & Sandstrom, 2017; Tura et al., 2019 identify barriers at the organization level. These barriers are related to the

lack of knowledge in the organization, lack of concepts, but also with the process of transforming the organization towards sustainable models. The lack of knowledge about the concepts of the CE and their application in the business (Bechtel et al., 2013; Rizos et al., 2015) make it difficult to identify the opportunities offered by CE and, as a result, the implementation of relevant strategies. Barriers can also be organizational, which can derive from the way of organizing itself, where sustainability can wrongly be understood as the responsibility of only one department (Ritzen & Sandstrom, 2017) where high-level managerial support is missing (Bechtel et al., 2013; Liu & Bai, 2014). Managers may lack the conceptual skills to understand and identify opportunities for the organization, may find it difficult to assess in the long-term (no vision), or may find it difficult to adapt to external changes (lack of flexibility).

Barriers can also be financial (Bechtel et al., 2013; Ritzen & Sandstrom, 2017; Rizos et al., 2015). Especially in this period that is characterized by frequent price fluctuations and great uncertainty, business find change difficult, financially unaffordable, moreover the lack of knowledge creates problems in identifying mechanisms for measuring benefits. Since the majority of managers are oriented towards quick returns on investments (Ritzen & Sandstrom, 2017) it is difficult to convince managers for changes that require time and investments and that generate long term benefits.

Another barrier is technology (Bechtel et al., 2013; Gumley, 2014; Ritzen & Sandstrom, 2017). CE cares about the quality of products and their redesign so that they remain in circulation as much as possible in extending their life cycle or reusing them. The lack of technological developments creates problems in the collection and recirculation of products (lack of efficiency precisely due to the lack of appropriate technologies).

6. Business models for circularity archetypes

The goal is to move from a linear economy with an open loop system to a circular economy with a closed-loop system. In this implementation effort there are studies that focus on the 3R principle (Morsetto, 2020; Reike et al., 2018). Economic growth in a circular economy is not achieved by producing more products, but by keeping more products in circulation (Ritzen & Sandstrom, 2017), certainly ensuring the efficiency of this use.

Table 1. Strategies for circulation

<i>The strategy</i>	<i>The goal</i>
Reduce	Resource Energy

	Waste
Reuse	Materials Products
Recycle	Recover and reprocess products
Efficiency	Resources used
Design	Eco-design

Source: (Morsetto, 2020)

The above table (Table 1) shows the different strategies that the organization can use to implement CE concepts in its BM. It is essential that for each of them the business set clear objectives. On their implementation plans, they can use various BMs that the research offers. In addition to the aforementioned strategies, we must also evaluate the concepts of down cycling and upcycling. For example recycling is a strategy that has been circulating for many years now. The purpose of recycling is to return the product and use parts of it. However, with its usage, the product loses its value until it is thrown into the landfill. While in the circular economy, the goal is to keep the product in circulation in the economy as much as possible, thus aiming to retain the value of the product, materials and components high. This is about upcycling and requires solutions that are more sophisticated. Likewise, the circular economy can not be achieved by the implementation of the circular concept by just one company. Still each company must find its own BM in order to implement the circular concept. The studies present us with different models, which in themselves acknowledge four key principles: a) they are sustainability oriented; b) they all search for extended value creation; c) systematic thinking is vital d) it is imperative the integration of different stakeholders (Breuer, 2013). For the aim of determining a common language in circularity, there are studies that identify BM patterns. So as Lüdeke-Freund et al., 2018 design 45 patterns assigned in 11 groups in relation to the three dimension of sustainability, Breuer et al., 2018 stipulate from literature six SBM tools:

The Business Innovation kit presented by (Breuer, 2013)

The Sustainable Business Canvas presented by (Tiemann & Fichter, n.d.)

The Flourishing Business Canvas presented by (Upward & Jones, 2016)

The Value Mapping Tool presented by (Bocken et al., 2013)

The Triple Layered Business Model Canvas presented by (Joyce & Paquin, 2016)

The Business Model Canvas extended for infrastructure presented by (Foxon et al., 2015)

Bocken et al., 2014 define eight archetypes considering grouping by technological, social and organizational types of innovation as considering the path to sustainability as an innovation process within the organization. Gassmann et al., 2014 elect 55 patterns considering the framework who/what/how/why of a BM. Using BM Canvas (Osterwalder, 2004) for describing the characteristics of the BMs, Remane et al., 2017 present 182 patterns. That is considerable research on Sustainable BM, focusing on the concept of circularity and its implementation. It is frequently argued that experimentation can be a good strategy for exploring new BMs and at the same time gaining a good understanding of the BM as an item of investigation (Bocken et al., 2019; Breuer et al., 2018; Ritzen & Sandstrom, 2017; Schoormann et al., 2021).

7. Difficulties facing SMEs on circular concepts, specifics of Albanian businesses

Companies should study the value chain, materials flow and products to assess the effect of applying CE concepts. As the path to sustainability is considered kind of innovation (Bocken & Konietzko, 2022), the obstacles to innovation in SMEs may be considered. There are internal and external obstacles to innovation (Strobel & Kratzer, 2017; Wang, 2016). The internal obstacles are those that once identified, may be improved by the company itself. As the BM needs to be changed, the owner/manager has the responsibility to identify opportunities the implementation of circular concepts offers. Culture as an internal obstacle (Strobel & Kratzer, 2017) needs to be tackled and the vision of the business too. Without thinking in the long run, it is not possible for the companies to identify the opportunities the shift to innovation gives to the company. This also needs knowledge and entrepreneurs are commonly people that have learned through their experience, they usually do not turn their attention to science which delivers a lot of successful case studies. On the other hand, looking on successful cases and experimenting BMs as a way of discovering and learning, demands considerable resources (as for example financial capital) and gets significant risks (often also failure) (Evans et al., 2017).

Referring to Albania for 2018-2020 there were only 36.6% of innovation active enterprises, 25.9% of which carried any type of innovation, 31.6 % carried at least one innovation in business processes⁹. On 2022 Albania has become part of the European Innovation Scoreboard Report, where it is ranked as an innovator in development country with a ranking of 41.7% relating to the European average¹⁰. Even if the relatively strong points for Albania are among other criteria, selling of innovative products, product innovators and technologies relating to environment, the situation to individual companies doesn't seem the best. It may be the high cost of innovation and the short term view of their activity may be for Albanian SMEs that also present strong barriers

⁹ More information on INSTAT, Innovation table ½ available at <http://www.instat.gov.al/al/temat/shkenc%C3%AB-teknologji-dhe-inovacion/inovacioni/#tab2>

¹⁰ More information on INSTAT, European Innovation Scoreboard for 2022, Albania Profile, available at http://www.instat.gov.al/media/10684/rankimi-evropian-i-inovacionit-viti-2022_.pdf

(Deshati, 2016). While Domi et al., 2020 in their study on tourism sector in Albania have found that customer orientation helps Albanian businesses to develop innovation culture and to make possible new products and services. Moreover businesses consider sustainability as an issue to tackle immediately in order to survive (Icka et al., 2021).

8. Conclusions and recommendations

Heavily influenced by Joseph Schumpeter the evolutionary economics considers economy as a system in continuing change (Nelson et al., 2018). Continuing this logic, this can help in improving knowledge on the way and the reasons of the economic development. As a unit of analysis business models are considered very important for organization performance and its sustainability (Schaltegger et al., 2016; Seikkula-Leino et al., 2021). The strategies for circulation (Morseletto, 2020) may be useful to the business for using efficiently their resources. Interesting are the tools presented by Breuer et al., 2018 which take into consideration the three dimensions of sustainability. As Bocken & Konietzko, 2022 state, the path through sustainability is innovation, which in itself is a process of change. The barriers of SMEs to change are a good reference to find strategies in order to smooth this change process and get the best of it. As sustainability is an important element for survival (Icka et al., 2021), it is imperative for Albanian SMEs to think on the long term (Deshati, 2016) in order for them to identify the opportunities sustainability offers to businesses.

As sustainability defends a stakeholders' view (all stakeholders' interest to go sustainable) an empirical study, which considers the desirability of the customers to embrace sustainability issue may be of great interest. Being the customer in the focus of each business, may be a good driver of the business to sustainability issues.

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Theoretical Approach on Circular Economy in Built Environment, Case of Albania

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Abstract

The circular economy is an economy built from social systems of production-consumption that maximize the service produced by the linear nature-society-nature material and energy flow. It can be perceived as a new way of creating value and well-being by extending product life through improved design and service, and reallocation of waste as its core principle. The data from the Institute of Statistics (INSTAT) showed that the Gross Domestic Product is estimated in increasing during the first quarter of 2022, where construction is considered the accelerator of the economy. The construction sector registers the highest contribution to the growth of the Gross Domestic Product with 1.95 percentage points. As this sector grows bigger over time, Albania is facing another problem: the management of construction waste. Following the EU best practices, Albanian authorities have drafted an Integrated Waste Management Strategy over the concept of “zero waste”, so that the waste is collected and treated as raw materials and management is done under the concept of circulatory systems. The construction sector in Albania, apart from its importance, is still facing difficulties in approaching circular economy as the current legal framework does not provide a basis for the implementation of the concept of circular economy in the country. Besides the environmental and ecological benefits, the approach towards circular economy principles in the construction sector would avoid the costs of landfills and waste disposal, as these principles would help businesses to draft future policies for operating and mitigating regulatory risks.

Keywords: circular economy, construction, waste, regulations, inert

JEL Code: L74, Q53

I. Introduction

The circular economy can be defined as an economy that is restorative and regenerative by definition and aims to keep products, components, and materials at their maximum use and value at all times [1]. It can be perceived as a new way of creating value and well-being. The New Urban Agenda (Habitat III) of the European Union has positioned the circular economy as one of the twelve priority thematic areas which contribute to the common vision of the European countries for a better and sustainable future, in the context of the United Nations Agenda 2030 for sustainable development [2]. The circular economy concept has been accepted as a way to address sustainability, by not preventing current economic benefits and future generation opportunities: it serves as an alternative business model and as a way to create additional job opportunities [3]. Extending product life through improved design and service, and waste reallocation is its main principle. In a circular economy, materials and waste are reused for as long as possible, meaning that if a product is broken, it will be repaired. This means that products are designed to be reused or to be used more intensively in sharing them with others. As the government has its own role in simulating the industries in approaching the circular economy, consumers too, have an important role to play by choosing these sustainable products over the standard ones. Also, their behavior is significant in using products for much longer or by sharing them with others. The successful implementation of a circular economy is impacted by all the actors involved: central and local government institutions, producers, and customers [4].

The construction sector is one of the world's largest consumers of energy and raw materials. This is constantly damaging the environment in the EU, where construction is responsible for around 40% of CO₂ emissions and nearly a third of all waste [5]. Furthermore, new innovative business models would constitute an additional global market opportunity of more than 600 billion Euros by 2025, with a double-digit growth rate. In recent years, the world is emphasizing the reduction of the carbon footprint in the construction sector, where the majority comes from the transportation of materials [6]. Reducing the carbon footprint of this industry can be achieved by reusing locally excavated materials. In this context, this paper aims to present the actual situation of Albanian construction sector regarding the circular economy approach, and also the current legislative framework of managing construction waste.

Mostly, the construction industry works in a linear manner using the principle “take, create, dispose of in landfills”. The process starts with extracting raw materials as inputs, processing them in becoming construction materials and assembling them in a way they cannot be destructed at the end of this process. In this manner, all the waste needs to be disposed of in landfills or incinerators as it has zero chance of reusing or recycling. In this regard, using circular economy contributes to reducing waste generation and resources extraction because these materials can be kept on a closed loop. The transition from a linear economy to a circular economy would bring great ecological improvements regarding how impactful is this sector towards the environment and ecological pollution. When taking in consideration the complexity and numerous actors involved in this construction industry, this seems a challenging task. Challenges can be associated with the variable lifespan of construction inputs and the changes in technology over time, the lack of secondary

markets, or even the difficulties in maintaining a good quality when recycling these materials [7]. All these can possess barriers to adopting a circular approach in the construction industry.

II. Literature review

Circular economy in the construction industry is not a new policy agenda item in Europe. Regarding to Jones & Comfort, circular economy is a testing challenge for this industry in Europe [8]. Many of major construction companies in Europe have been looking to integrate circular economy approach into their business models and some of them have made little steps in experimenting this initiative, but this manner of thinking is still at an early stage. In a broad view, the circular approach should cover all the supply chain, but as far, it has remained focused on waste and recycling. Moreover, there are concerns that these construction companies might use the concept of circular economy to justify economic growth while ignoring that such growth is essentially unsustainable.

Angelis-Dimakis et al., in their research paper have analyzed the Waste Management and the Circular Economy in Cyprus based on the evidence drawn from an EU-funded project entitled *SWAN* [4]. This project's objective was the design and development of a solid waste reuse platform that would affect 4 countries: Greece, Albania, Cyprus, and Bulgaria. In this paper, they highlight that the linear economy model cannot support the reduction and reuse of waste. This approach has led to an increased volume of waste and greenhouse gas emissions. Hence, there are many reasons and an added pressure to transit to an alternative model: that of circular economy. This possesses the challenge of adopting new European and national policies from businesses as it presents difficulties in financing new business models, resistance to change, and trade barriers such as taxation and legal frameworks.

Regarding the Albanian economy, related notions to the circular economy have their beginnings since 1960 or even earlier, with first tentative in differencing urban waste and recycling materials like paper, cardboard, and glass, because of input shortages and reducing costs [9]. In recent years, in Albania, there are a number of sectors which have approached the circular economy model as: meat processing, medicinal plants, egg production, recycling, cleaning, olive oil production. An empirical research on Albanian consumers has shown that Albanian consumers are worried about environmental matters, but this is not always reflected in the purchase behavior [10]. As one of the actors who plays an important role on circular approach, the Albanian consumer seems to not have a strong behavior regarding circular economy principles. Apart from the above sectors, businesses in the construction industry in Albania are far from using circular approach in their activity.

III. Construction sector in Albania and the importance of construction waste management

The data from the Institute of Statistics (INSTAT) showed that the Albanian Gross Domestic Product is estimated in increasing during the first quarter of 2022, where construction is considered as the accelerator of the economy. The construction sector registers the highest contribution to the growth of the Gross Domestic Product with 1.95 percentage points [11]. In the first quarter of

2022, the construction sector was the one with the highest growth followed by the real estate sector with 14.86% annual growth of the Gross Domestic Product. During recent years in Albania, engineering works and new constructions are dominating the building sector, especially when it comes to residential buildings; another signal of this growth is given by the increasing numbers of construction permits issued by the Albanian authorities each year.

Table 1: Construction sector growth in Albania, 2017-2021

	2017	2018	2019	2020	2021
Construction permits	819	1.194	1.094	961	1.369
Construction area (000/m ²)	869	1.443	2.022	1.608	2.317
Approximate value of constructions (billion ALL)	49,1	59,0	80,8	76,6	99,2
Yearly growth	128,5%	66,1%	40,1%	-20,5%	44,1%

Source: INSTAT, 2022

As described on the Table 1, during five recent years, the construction sector in Albania has shown a consistent growth except year 2020 when the pandemic situation impacted the whole economy and inhibited the growth of this sector. Even though the population has shown a shrinking trend, the residential construction sector is continuing its activity, where in 2021, the total area of the construction permits reached a record level in the last 5 years.

Table 2: Construction Cost Index in Albania, 2017-2021

	2017	2018	2019	2020	2021
Total Cost	99.1	99.7	99.9	100.1	101.9
Material expenditures (a+b+c)	102.0	101.6	100.9	100.0	102.4
<i>a. Construction materials</i>	<i>102.8</i>	<i>102.3</i>	<i>101.4</i>	<i>100.1</i>	<i>102.4</i>
<i>b. Electric and communication materials</i>	<i>100.1</i>	<i>99.3</i>	<i>100.2</i>	<i>100.0</i>	<i>102.7</i>
<i>c. Hydro - sanitary materials</i>	<i>98.7</i>	<i>99.2</i>	<i>98.7</i>	<i>99.7</i>	<i>101.6</i>
Salary expenditures	99.7	100.7	101.7	100.3	102.2
Machinery expenditures	97.8	97.7	98.6	99.3	100.1
Transport expenditures	98.4	100.5	99.8	101.0	103.1

Energy expenditures	100.0	100.0	100.0	100.0	100.7
Other costs	95.7	98.0	98.8	100.4	102.4

Source: INSTAT, 2022

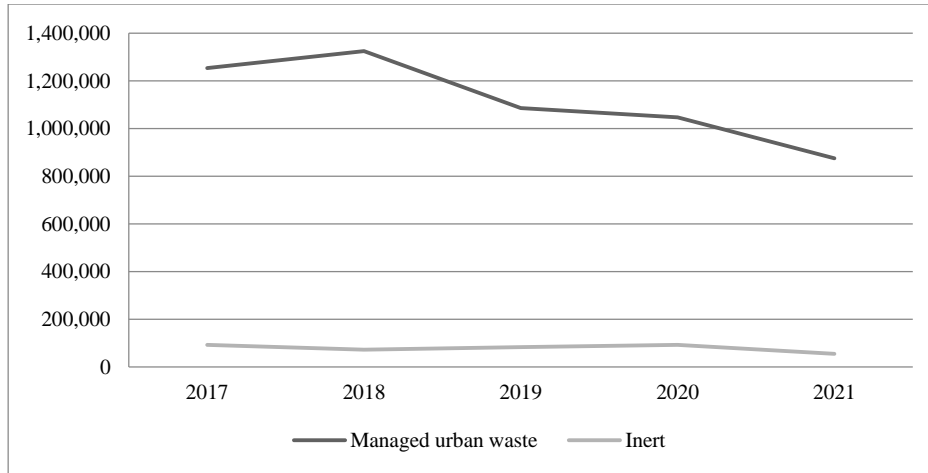
Table 2 gives us a numerical view of the Construction Cost Index in Albania during the period 2017-2021, which measures the price performance of: construction materials, labor costs, machinery, transportation, energy and other costs used in the construction of a typical dwelling (8-10 floors). The material Expenditure Index measures the performance of the prices of the main construction materials. This group consists of three subgroups: construction materials, electric and communication materials, and hydro-sanitary materials. The Labor Cost Index measures the performance of the wage bill for engineers, technicians and laborers. As seen from Table 2, the Construction Cost Index has increased during 2017-2021. The index of each group of expenses has increased, except for material expenses, which have decreased until 2020, but in 2021 they experienced an increase of 2.4%. The figures reflected in Table 2, re-emphasize the importance of a proper management of construction materials, with the aim of reducing costs and obtaining acceptable prices for consumers, by knowing that according to the Bank of Albania, the Fischer Index of housing prices increased by 9% on an annual basis on 2021 [12]. This change shows that, especially during the second half of 2021, the increase in housing prices has accelerated significantly.

The growth of construction sector and the increasing construction costs, possesses a challenge in managing the construction waste. In order to orient the construction businesses towards the circular economy approach, Albanian institutions have drafted the Strategy for Integrated Waste Management (2018-2023) published in January 2018. This revised Strategy was developed on the vision or perception of the concept of "zero waste", so that waste is collected and treated as raw materials and management is done under the concept of circulation systems, serving the criteria of using and preserving raw material resources in accordance with the concept of circular economy systems, to benefit from the standardized use and storage of raw materials [13]. Whereas, in the National Integrated Waste Management Strategy and Plan 2020-2035 published by GIZ in collaboration with the Ministry of Tourism and Environment, the main goal is the transition from a linear economy to a circular economy. This Strategy defines construction and demolition waste as a waste that comes from activities such as construction of infrastructure and buildings, partial or complete destruction of buildings and infrastructure, construction and maintenance of roads, etc. According to the National Action Plan, part of this Strategy, until 2025 is targeted 30% recycling/reduction of construction waste, until 2030 is targeted 50% recycling/reduction, and 70% recycling/reduction is targeted in 2035.

Regarding the waste management, INSTAT does not have clear data on construction waste. The waste is classified the waste in two main data groups: (i) family waste, and (ii) industrial waste and urban waste. In this perspective, we cannot have a clear analysis on construction waste throughout the years. Managed urban waste consist of organic waste, wood, paper, cardboard, glass, plastic, textiles, metals, dangerous non-hospital waste, inert, hospital waste and others. There

are three main ways of waste treatment in Albania: landfilling, recycling and incineration. The Association of Recyclers of Albania in 2019 has reported that there are about 38 private recycling company members and the processing capacity of the recycling industry in the country is about 498,480 tons/year [13]. The Graph 1 below represents the amount (in tons) for each year from 2017 to 2021 on managed urban waste and inert.

Graph 1: Managed Urban Waste and Inert (in tons), 2017-2021



Source: INSTAT, 2022

During these years, inert waste shows a stable trend with a slight downward trend in 2021. Compared to the managed urban waste, inert waste is more stable because during this period, it has grown more than urban waste in relative terms.

The European Landfill Directive provides technical and operational standards for the disposal of inert waste (determining the permeability of the bottom layer of the landfill for inert waste landfills: $K \leq 1.0 \times 10^{-7}$ m/s; thickness ≥ 1 m). According to these definitions, most of the inert waste is generated by construction and demolition activities [14]. However, not all waste generated by construction and demolition works is inert (wood, plastics, metals, topsoil with high organic content, etc). The Albanian Regulation no. 1 for the Treatment of Construction Waste from Creation to its Disposal aims to discipline the process of administration of construction waste, establishing concrete rules and requirements for all subjects operating in the field of construction [15]. The most important provision is the separation of construction and demolition waste and their recovery. Municipalities are responsible for determining the sites for temporary treatment and storage plants. As an instrument to enforce the regulation, a financial guarantee (minimum 5% of the value of the construction works) is provided to be deposited with the local government to obtain a construction and demolition permit. The deposit is returned only if the requirements of the regulation regarding the management of the waste are met. However, there is currently little or no recovery of construction and demolition waste, and dumping is mostly done in an uncontrolled

manner along roads, riverbanks, or on wasteland. Although the municipalities report annually on the quantities of inert waste, there is usually no proper monitoring of the inert waste generated in the country and as a result the quantities are calculated roughly. Even though this Regulation is a legal obligation to treat construction waste, it does not predict a circular approach regarding this treatment.

IV. Conclusions and recommendations

This paper aimed to present the actual situation of the construction sector in Albania and the importance of making circular economy an integral part of the sector, by analyzing the growth of construction industry, its costs and the generated construction waste. As described in the paper, circular economy presents an utter importance on promoting sustainable economy, as it can be perceived as a new way of creating value and well-being by extending product life through improved design and service, and reallocation of waste.

Management of construction waste is a challenge that construction sector in Albania is facing throughout its growth in the recent years. Research showed that there is no track of circular approach in this sector and further more despite all the legal obligations, it has been estimated that the data on the quantities or the impact of waste on the environment are not accurate and sufficient. Since there is still no differentiated collection in Albania, accurate data on the specific amounts of different types of waste cannot be generated, which impacts the overall analysis of construction waste management. Inert are calculated as a part of managed urban waste and throughout five recent years they reflect a steady trend. During the research conducted, we have found that recycling has progressed in Albania compared to a few years ago, as businesses that collect metals, plastics, paper and glass and recycle them, have been set up. Conceptually, a good recycling system makes it is easier for the circular economy approach to be implemented in the construction sector.

Regardless of the fact that in Albania, national strategies and action plans have been drafted regarding the management of construction waste, it turns out that the concept of "zero waste" still remains in the idea of recycling, dumping in landfills and burning through incinerators. Our country has progressed in legal alignment, however, the specific legislation related to the waste of the construction sector with the purpose of their circulation remains a challenge.

Transitioning from a linear economy to circular economy is not an easy process, as it needs technological updates on construction equipment, trained workforce, and also a farsighted strategy on sustainability. The most challenging task in managing construction and demolition waste remains the fact that all the materials need to be prepared or altered since the beginning of the construction process, as the majority of them do not have the proper form or compound to be recycled or reused again. In order to reuse back in the process the construction and demolition waste, Albanian businesses need to invest in advanced technologies, which have their own cost.

Our research conducts that circular economy principles in construction industry in Albania, except for environmental benefits like lowered carbon emissions and reduced biodiversity loss, would contribute towards avoided costs on landfills, increased value of products and services by

accounting for reduced deconstruction and landfill costs, as these principles would help businesses to draft future policies for operating and mitigating regulatory risks. By analyzing the increasing construction costs, we conclude that circular approach would make a positive impact on reducing these costs and maintaining an acceptable housing price for consumers. Furthermore, this approach would have a positive impact on competitiveness and innovation, create job opportunities and improve sustainability of these businesses.

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Measuring business sustainability in Albania - theory and constraints

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Abstract

Sustainable economic and social development is widely affected by climate changes. In order to guarantee a healthy business activity for a long-term period, an enterprise must take in consideration and respect the interests of all the stakeholders. Thus, sustainable entrepreneurship is directly related to the economic, social, and environmental system. Business entities that will not adapt to climate change, will be at risk, as they will suffer consequences such as: increase of the price of raw materials, increase of the costs of maintenance and materials, and even the interruption of their activity. While those businesses that embrace change, will not only maintain their current processes, but will also experience greater competitive advantages. It is widely recognized that the success of a country in undertaking climate change policies is strongly related not only to public policies but also to the success of the private sector in undertaking initiatives to respond to the impacts and risks associate with the climate. The purpose of this study is to offer a literature review of the impacts that sustainable entrepreneurship has on the sustainable development of a country and discuss Albania path towards achieving climate goals and adapting to climate change.

Keywords: Sustainable entrepreneurship, Climate change, adaptation, Albania.

Jel Code: Q54, M13

Introduction

The concept of sustainable development is closely related to the term sustainable entrepreneurship. In order for an enterprise to guarantee a healthy business activity in the long term, it must take into account and respect the interests of all actors. So, this concept is directly related to the economic, social and environmental system [1]. Important national and international discussions are currently taking place regarding planning, financing, and implementing of adaptation actions. Climate action has been set as a priority of the government in Albania. With the signing of the Paris Agreement by the Government (New York, April 22, 2016), Albania has entered the new era of acceptance of

international climate policies, where all parties collectively aim to keep the global temperature increase to 2° C above the pre-industrial level [2]. The National Climate Change Strategy and Action Plans of Albania [3] have been designed in order to support the implementation of EU legislation on the environment and climate, aiming at strengthening the inter-sectoral coordination for jointly implementing climate measures, environmental protection and sustainable development policies. Furthermore, the leaders of the Western Balkans, gathered in Sofia in 2020, at the Western Balkans Summit, acknowledged the need to lay the basis for a major transformation of the region, which would turn the challenges of sustainable development and climate change into opportunities and would link the elements of the "European Green Deal" with the public priorities in each country [4].

Regardless of the efforts to adapt legislation or even draft national strategies by public institutions, the success of a country in undertaking climate change policies is strongly related to the success that the private sector has in undertaking initiatives to respond to the impacts and risks of climate change [5]. In fact, the private sector is not immune to climate change and disaster risk [6]. Business entities that do not adapt to climate change will be at risk, as they will suffer consequences such as: an increase in the price of raw materials, an increase in the costs of maintenance and materials, and even interruption of their activity. While those businesses that embrace change, will not only maintain their current processes, but will also experience greater competitive advantages [6]. Therefore, business entities must embrace sustainability practices in order to contribute to a green economy.

This paper presents a literature review of the measures and actions that the private sector should undertake to improve their resilience to climate change. The paper also presents some obstacles to the implementation of adaptation strategies in Albania. Finally, the paper concludes with some discussions on some recommendations and future research in the field.

Private sector response to climate change

The climate change adaptation term has been defined in the Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) as "the process of adapting to the current or expected climate and its effects" [7]. A few years later this term appeared in the international policies arena in comparison to the concept of mitigation. Adaptation to climate change received a lot of attention in the Bali Action Plan [8]. The discussions on adaptation have evolved over time. Until 10 years ago, the greatest responsibility in guaranteeing climate change adaptation was mainly attributed to the public sector [9], while today in the international agenda of sustainable development, the private sector is increasingly being called upon to contribute to adapt to climate change [10]. This is best evidenced in the establishment of international policies and in the creation of a series of financial mechanisms [5] such as the green global fund [11] that target sustainable financing for adaptation purposes. The financial costs associated with floods, droughts, storms, high temperatures, and other weather-related calamities have gradually increased as a result of

climate change. Therefore, the need of the private sector to action to adapt to climate risks is being more and more recognized.

In the last decade, the literature on climate change adaptation has been enriched considerably and many distinctions and typologies have been proposed [12]. In the international literature, various authors express changes in adaptation measures depending on the size of the companies, on the sector in which they operate and the location and coverage they have in the market if they operate in a certain region, country or are multinational ones. The main studies that focused on the identification of adaptation measures taken by the private sector mainly dealt with the measures taken by large corporations. The main reason is that large companies have greater capacity to adapt and also have the ability to respond to the opportunities that can be created by climate change [9].

The interventions for adaptation purposes can be grouped into proactive and reactive ones. Reactive adaptation refers to those responses that are undertaken by entrepreneurs after the extreme event has occurred, for example: the set of measures that a company undertakes after a disaster, as a need for immediate intervention. Whereas proactive adaptation refers to taking measures before an event occurs in order to reduce the negative impacts of a probable event in the future [12]. Based on the perception of the uncertainty of the future event occurrence or the lack of information on the magnitude of the event, proactive measures are not often considered by businesses [13]. Therefore, it is perceived reactive measures are those that are considered sufficient by commercial companies to be undertaken.

Another criterion used to classify the adaptation responses that companies can undertake, refers to whether it requires a major investment in infrastructure or simple intervention in the adaptation of procedures or in the adoption of a preventive policy. The hard adaptation and soft adaptation terms are used for this classification. Hard adaptation means interventions in infrastructure that require the commitment of very large investments which usually occur in hard industry sectors. Whereas soft adaptation refers to interventions such as vulnerability assessment, risk assessment, their transfer to third parties, preparation and contingency plans, implementation of risk management methods, etc. [10].

Although the private sector may be aware of the impacts of climate change, few of the companies have taken measures to adapt. In order to increase their capacities to adapt, it is necessary to encourage the creation of different partnerships between corporations, governments, NGOs and the education system. The next sections focus on the constraints faced by the private sector that aim at implementing adaptation measures, focusing mainly on the Western Balkan region and Albania.

Constraints experienced by the private sector in implementing adaptation strategies in the Western Balkans

We established that business entities are not immune to climate changes and disaster risks. Businesses entities that do not adapt will be at risk, while those that embrace change will see greater opportunities. On the other hand, it is not easy for the business sector to implement adaptation strategies. Understanding the factors and drivers that discourage the private sector from taking actions to adapt to climate change is very important, as it provides information for policy makers and provides more favorable solutions to avoid or minimize all the barriers.

The first obstacle discussed in the literature in relation to the unwillingness or unfeasibility of private companies to engage in adaptation action is of financial nature. The engagement of the companies can be considerably affected if they cannot afford finance adaptation [21]. The high cost of the adaptation options is considered by the companies as the main reason for not implementing risk management actions. Adaptation actions are mostly implemented by the companies that have been publicly subsidized or that have found it easier to pass on the costs to consumers [10]. However, the OECD's SME Policy Index has identified that, SME greening measures and policies are now included in overall SME strategies in almost all of the Western Balkan economies, but with limited implementation. The existing SME strategies of Western Balkan Countries, include measures related to providing advice and guidance to SMEs on improving resource efficiency (in particular energy efficiency), promoting eco-innovation and introducing financial incentives for SME greening [14].

Another important barrier to undertaking action on climate change for the private sector is the lack of expertise or capacity. It is evident that if companies have in-house capacity and analytical expertise, they are more likely to react to climate change. They can undertake risk assessment and consider possible adaptation actions. On the other hand, those companies which lack in-house capacity and experience to carry out risk assessments are expected to be slower to implement adaptation actions [10]. A survey aiming at monitoring the existing practices and gathering information on the preferences of the practitioners and experts for more education in the field of climate change adaptation and disaster risk management was conducted within an EU funded project. The results indicated that currently the vocational education systems in the Western Balkan region cannot be considered as a structured system for the purpose of life-long education of professionals and do not offer much in terms of education for climate and resilience. The respondents indicated the needs for practical skills, followed by improved theoretical knowledge. Among others, the survey displayed a significant interest to take part in the future professional courses, even under a voluntary scheme [15]. The results of another survey conducted by Shyle (2018) [16] in Tirana, Albania, highlight the level of knowledge and awareness that people and businesses have about sustainable development. The study results show low levels of knowledge by students and businesses on the concepts of sustainable development and the need for further measures to improve this situation in the future [16].

Private sector can significantly be influenced by the institutional context in which companies operate. Decision making can be facilitated, and adaptation actions can be encouraged if the climate change research and development infrastructure is in place. This includes government initiatives promoting research on modelling climate scenarios, on climate change impact analysis, and on downscaling from global to regional models [10]. More specifically, it is necessary to establish partnerships with private sector, scientific organizations, and academia. In this way, key stakeholders can facilitate adaptation of the companies by providing them with guidance, information, and shared capacity.

So far, the role of the private sector has been seen only in terms of financing, without evaluating and analyzing the way this sector is reacting to the risks or opportunities of climate change. Furthermore, research activities and initiatives to address climate change have been undertaken mainly at the level of international institutions or within the framework of strategies drawn up by public institutions. The role of Higher Education Institutions (HEIs), which can be considered research institutions in Albania, is very insufficient in this regard. Several research addressing climate change have been carried out at the University of Tirana [17] and the Agricultural University of Tirana [18]. However, the research approach at the university level has been scarce, influenced by the lack of research tradition in this field and the interdisciplinary character of the field. It is indispensable that scientific research institutions such as Higher Education Institutions contribute not only to capacity building and the provision of interdisciplinary knowledge for a sustainable society but also act as promoters of concrete actions in the field of climate change, thus influencing in rebuilding our fragile economy [19].

Knez et al (2022) suggests that EU must use its influence, expertise, and financial resources to mobilize its neighbors to join them on a sustainable path [20]. Their study revealed that in Western Balkan countries the implementation of the necessary regulations and strategies towards climate change mitigation is at a low level. According to the authors, the reason for this most often lies in the insufficient commitment of decision-makers to make significant changes in the field of climate change transition. This low level of commitment may be due to the low level of awareness that several entities have on issues on climate change and sustainability.

Framework of climate change policies and actions undertaken in Albania

Climate changes have also been present in Albania since the end of the 90s, but this issue has gained more attention in Albania in recent years within the framework of environmental protection policies. Some of the phenomena that demonstrate climate change in Albania are the rise of extreme temperatures, the increase in heat waves, the duration of drought periods, the decrease in annual precipitation, destruction of dwellings, infrastructure and natural environment from floods and erosion in the coastal area and along the riverbeds. All these effects from the environmental impacts of climate change strongly affect many sectors of the economy, especially agriculture and energy sectors [2].

Albania has undertaken many policies and actions aiming at mitigation of the consequences of climate change and adaptation. In 1995, Albania ratified the United Nations Framework Convention on Climate Change. In 1998, the Department of Air and Climate Change was established by the Ministry of Environment, to address the relevant issues in coordination with UNDP (United Nations Development Programme). A series of measures related to the increase of energy efficiency, the use of innovative technologies in the environmental aspect for the elimination of carbon dioxide were compiled in order to achieve the objectives of this convention. However, at national level, it was made possible to reduce gases by 34% [2].

In 2014, the Albanian government established the Inter-ministerial Working Group on Climate Change, which coordinates all the institutions involved in climate change processes and facilitates the integration of climate change into relevant new and existing policies, programs and activities. Albania ratified the 'Paris Agreement 2015' (COP21 in 2015) within the framework of the United Nations, in the Conference of Parties on Climate Change, in which the majority of national governments have approved measures to reduce the emission of greenhouse gases in the atmosphere, which has an impact on the industrial patterns of each country. One of the most important requirements of the UNFCCC for Albania is the development and implementation of policies that have a tangible impact on climate change and its effects [2].

In order to achieve the objectives, set at the Paris Agreement Climate Conference (COP21 in 2015), to keep the temperature below 1.50°C through mitigation strategies, Albania must reduce greenhouse gas emissions by 45% of 2010 levels until 2030 and to achieve net zero emissions by 2050 [2]. The achievement of these objectives requires significant efforts at the level of public and private institutions. For this reason, the production and consumption of fossil fuels must be reduced by promoting the use of clean, renewable energy.

In 2016, the government of Albania approved the 'National Strategy for Development and Integration 2015-2020', which reflects the vision, priorities, objectives, and tools for the social and economic development of the country until 2020. One of its main pillars was the "increase through sustainable use of natural resources and territorial development". The Strategic Document on Climate Change and the Action Plan its effects were adopted by Albania in 2019. The aforementioned document lists six priorities for the "climate change mitigation strategy," including ensuring sustainable economic growth, accounting for Nationally Determined Contribution emissions with an objective that all sectors contribute to, setting up a monitoring, reporting, and verification system in accordance with EU requirements, and building the capacities of pertinent institutions and inter-institutional cooperation [3].

In recent years, the Albanian government has reformed and liberalized the electricity market by approving the Albanian Market Model and the Regulatory Framework that provides for concession agreements for small hydropower plants, oil and gas concession, as well as by promoting the construction of energy parks. Electricity generation capacity has been improved through the construction and operation of several small hydropower plants (HEC), but the country remains dependent on hydrogen for power generation [2].

Recommendations and Future research

Economic and social development are widely affected by the impacts of climate change. It is of critical importance to find ways and solutions for a sustainable and resilient society, able to build back better our vulnerable economies. Investors, insurers, businesses, cities and citizens across the EU and the Balkans should be able to access data and to develop instruments to integrate climate change into their risk management practices.

Sustainable business practices include but are not limited to manufacturing products from recycled or recyclable materials, by using processes that do not deteriorate the environment, by designing facilities to avoid permanent change in local ecosystems, and by involving communities, employees, suppliers, and resellers as partners in strategic planning.

Actions to adapt to climate change and sustainability go beyond a single institution, a single sector, even a single country. These actions require joint efforts among research institutions, private and public sector. Uniting different actors within a common goal is a prerequisite for a climate initiative to be successful and provide solutions to problems for the country's development.

The cooperation approach simultaneously requires the combination of

- supporting research institutions by combining their research expertise with the expertise in the field of capacity building
- making the business sector aware of the needs to undertake initiatives related to climate change and
- supporting public institutions engaged in science and technology in accordance with national priorities, cooperating with all relevant institutions and sectors

So far climate action in Albania has been directed and focused on the government and legislative bodies, which have defined the regulatory framework and climate strategies. The involvement of other actors, including the academic world and private sector, for this purpose has been very cursory. Research on climate change in Albania is still in its pioneering phase. Although climate has entered the lexicon of the research community, especially through the educational system, research and results in the field of climate, energy efficiency and environmental management in general are very limited.

Our research work in the future will constitute in evaluating the level of knowledge and awareness on climate action and risk management procedures by Albanian private sector. The study will be carried out with a sample of businesses selected according to the sectors of interest defined according to Agrawala, S. et al. (2011). The results of the study will identify the level of knowledge and measures that businesses take to protect themselves from climate change and its consequences, as well as identify their needs for knowledge related to sustainable development and climate change.

In the future in Albania, research should be focused on: fully understanding the barriers that prevent the private sector from taking measures to adapt to climate change; identifying the factors that encourage businesses to take measures; identifying the measures that are currently taken and the evaluation of the successes of their results to mitigate or avoid climate change risks. A broader understanding of the typology and level of adaptation of the private sector will determine the most appropriate level of combining public policies and measures taken by the private sector in Albania and encouraging the design of policies that can foster actions undertaken by the private sector.

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Urban waste management in Albania and public investment funds allocated in the past years

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Abstract

Waste is an unavoidable by-product of most human activity. Generation of waste materials is one of the greatest concerns of the modern world. Waste composition reflects cultural and technological trends and varies greatly between different continents and regions over time. Waste can be classified into various ways depending upon their type and source. According to Law Insider, Urban Waste is defined as solid waste collected by or on behalf of municipal authorities and disposed of through the waste management system. It includes household waste, waste from administrative, social, and public facilities. Urban waste generation is massive, and the process of collection and disposal requires huge expenses. In Albania also, most of the total waste generated is urban waste. It represents on average 85.1% of total waste during the last 6 years. That is why the focus of this article is urban waste.

This paper presents some theoretical concepts and basic facts about the importance of urban waste management, and especially focuses on statistics regarding waste management in Albania and the amount of public investment funds allocated for urban waste management over the past years. Most municipal solid waste generated worldwide is still deposited at landfills and waste dumps.

Information on urban solid waste in Albania is published by the Institute of Statistics. It is annual and at country level. Urban waste in Albania, is collected and disposed by municipalities and treated by both local and central government. According to the data available, most of the population is covered with community waste services and the amount of managed waste compared to the total waste generated has been increasing over time. Also, public investment funds for urban waste management have been increasing over the past years.

Keywords: waste classification, urban waste, waste management, waste statistics, public investment funds.

Jel Code: Q53, E6

1. Introduction

According to the World Bank report *What a Waste, A Global Snapshot of Solid Waste Management, 2018*, the world is on a trajectory where waste generation will drastically outpace population growth by more than double in 2050. Although we are seeing improvements and innovations in solid waste management globally, it is a complex issue and one that we need to take urgent action on. Waste can be classified into various ways depending upon their type and source. Urban waste generation is massive, and the process of collection and disposal requires huge expenses. In Albania also, most of the total waste generated is urban waste. It represents on average 85.1% of total waste during the last 6 years.

In this article we will focus in urban waste management in general and more specifically in public investments allocated for urban waste management in Albania from the central government.

According to Law Insider *Urban Waste is defined as solid waste collected by or on behalf of municipal authorities and disposed of through the waste management system*. It includes household waste, waste from administrative, social and public facilities. This term also describes waste resulting from commercial, recreational and similar activity the amount and composition of which enables treatment as part of urban waste. There are different types of waste treatment and disposal like: landfill, incineration, composting, vermicomposting, open dump. Different countries use different techniques.

The purpose of this article is to present some theoretical concepts and basic facts about the importance of urban waste management, and especially present statistics regarding waste management in Albania and the amount of public investment funds allocated for urban waste management over the past years.

The first part presents the theoretical concepts regarding urban waste, and some facts regarding its management. The second part presents the methodology used for the data processing. The third part focuses in details in different statistics related to waste management in Albania and public investment funds allocated for urban waste management over the past years. The conclusions present the main findings of this analysis.

2. Literature review

Waste is an unavoidable by-product of most human activity. Generation of waste materials is one of the greatest concerns of the modern world. Worldwide cities are rapidly expanding, creating visible environmental and social challenges. Everyday millions of informal waste pickers reclaim recyclables from household waste to earn their living, particularly in low-income residential areas. Today humans generate more waste than ever before, not only because of dramatic population increase over the past centuries, but also because of the changed nature of consumption and the different composition of solid waste. (Gutberlet, 2018)

The world generates 2.01 billion tons of municipal solid waste annually, with at least 33 percent of that—extremely conservatively—not managed in an environmentally safe manner. Worldwide, waste generated per person per day averages 0.74 kilogram but ranges widely, from 0.11 to 4.54 kilograms. Though they only account for 16 percent of the world’s population, high-income countries generate about 34 percent, or 683 million tons, of the world’s waste. (Kaza, Yao, & Bhada-Tata, 2018)

Municipal Solid Waste (MSW), commonly called “trash” or “garbage,” includes wastes such as durable goods (e.g., tires, furniture), nondurable goods (e.g., newspapers, plastic plates/cups), containers and packaging (e.g., milk cartons, plastic wrap), and other wastes (e.g., yard waste, food). This category of waste generally refers to common household waste, as well as office and retail wastes, but excludes industrial, hazardous, and construction wastes. The handling and disposal of MSW is a growing concern as the volume of waste generated in the U.S. continues to increase (Center for Sustainable Systems, 2022).

Urban waste generation is massive, and the process of collection and disposal requires huge expenses as well as being time consuming. Therefore, there is an existent demand for the improvement of sustainable, efficient, and low-cost technologies to monitor and properly manage the huge quantities of waste and convert these wastes into energy sources. A shift toward waste minimization and away from depositing it at landfills is important. Waste collection is a critical step in managing waste, yet rates vary largely by income levels, with upper-middle- and high-income countries providing nearly universal waste collection. Low-income countries collect about 48 percent of waste in cities, but this proportion drops drastically to 26 percent outside of urban areas (World Bank, 2018).

Waste can be classified into various ways depending upon their type and source. Based on the type of waste, **there is solid waste, liquid waste and gaseous waste**. Meanwhile, based on the sources of waste, there are 8 types of waste:

Municipal sources of waste. Includes garbage from family unit, workplaces, schools, hotels, souks (open air marketplace) and other public places. The major components are food waste, paper, plastic, rags, clothing, household broken things and many more.

Agricultural sources of waste, includes waste produced because of various agricultural operations (fertilizers, pesticides, wastes from farm, poultry house and slaughterhouses etc.

Medical sources of waste generated from hospitals, clinics, laboratories etc (surgical items, meddles, blood, parts of body, pharmaceuticals etc.)

Industrial sources of waste, which are the wastes discharged from manufacturing and processing units like food processing industries, cement factories, power plants, textile industries etc.

Electronic sources of waste, also known as e-waste or e-scrap includes telephones, televisions, music player, DVDs, CDs, computers, mobiles etc. which are discarded.

Mining sources of waste

Wastes from demolition or construction

Radioactive sources of waste (Bhat & Wani, 2019).

Also, we have Biodegradable and Non-Biodegradable Waste. Food and paper are perfect examples of the first one. Meanwhile non-biodegradable waste cannot be further decomposed via the action of the microorganisms. Such waste is the major source of toxins in the landfills. Chemicals, metals, plastics, paints, rubber, etc. are examples of non-biodegradable wastes.

There are different types of waste treatment and disposal like: landfill, incineration, composting, vermicomposting, open dump. Different countries use different techniques. Landfills are still necessary, but when uncontrolled they are a source for environmental impacts on soil, water, and air. They are located close to urban agglomerations, sometimes competing with environmentally protected areas. Landfills and dumps generate significant greenhouse gases, primarily methane (5–10% of global methane is emitted by landfills) and carbon dioxide, as microbial communities decompose the organic matter contained in the waste (World Bank, 2018). Meanwhile waste incineration (including Waste to Energy) and other thermal processes are local sources of air pollution, constituting additional health risk factors to city dwellers, who often already have to cope with serious air contamination issues. Yet, even in cities where organized waste pickers perform this service, waste incineration is under consideration, funded through PPPs (Gutberlet, 2018).

Waste composition reflects cultural and technological trends and varies greatly between different continents and regions over time. Most municipal solid waste generated worldwide is still deposited at landfills and waste dumps (70%), while 19% is officially recycled or treated by mechanical or biological treatments and a small proportion is incinerated (11%). The burning of waste is common, particularly in and around informal settlements and in rural areas (Gutberlet, 2018).

Modern solid-waste management plants in most developed countries now emphasize the practice of recycling and waste reduction at the source rather than incineration and land disposal (World Bank, 2018)

3. Tools and methodology

The methodology used in this article is with both secondary and primary data. The first part, focusing on the literature review, presents the main findings of different authors regarding the rising levels of urban waste and waste management. For the statistical analysis regarding waste management in Albania, the data has been collected from the Institute of Statistics (INSTAT). The collected data has been used to calculate statistics like population coverage rate with community waste services, total waste managed out of total waste generated, urban waste compared to total waste, composition, and treatment of urban waste.

The data regarding public investment funds for urban waste management in Albania has been retrieved from Ministry of Finance and Economy. Public investments are with domestic and foreign financing. This data has been processed to calculate the percentage of funds that go for waste management compared to the total funds that go for public infrastructure. Waste management projects are grouped under the budgetary program with the same name “**urban waste management**” which is part of the funds of Ministry of Transport and Infrastructure. Prior to 2017, this program used to be part of the Ministry of Environment. All the budgetary figures that are presented in this paper refer to the initial budget approved in parliament, not the revised budget during the year.

4. Urban waste management in Albania

Until 2018, the statistics on “Urban Solid Waste in Albania” were based on data gathered from the waste collection and management entities, through the annual survey on urban waste. In 2020, for the collection of data on urban solid waste, INSTAT applied for the first time the innovative method through "online" questionnaires in all municipalities of the country.

Municipal solid waste is deposited in waste collection bins and in our country, they are generally collected not separated by type. Industrial waste resulting from products and services of small business entities in the urban territory are often dumped in the same sites (Institute of Statistics, 2020).

According to the definitions of European legislation Municipal solid waste, is considered any solid substance or object that its owner is interested in abandoning and wants or is obliged to dispose of. The owner removes these physical materials from himself, thus losing any concrete interest in these substances or objects, regardless of the values they may carry at the time of abandonment.

Information on urban solid waste in Albania is annual and at country level. The data presented in this publication were collected through online questionnaires, completed by staff dealing with waste management in the respective municipalities.

In Albania, most of the total waste generated is urban waste. It represents on average 85.1% of total waste during the last 6 years varying from 82.8% to 86.2%. The remaining part is mostly industrial waste managed together with urban waste. That is why the focus of this article is urban waste. In Albania, it is collected and disposed by municipalities and treated by both local and central government. The respective Directories of Cleaning and Urban Waste in Municipalities follow the progress of the waste collection and disposal. According to the data from the Institute of Statistics, most of the population is covered with community waste services. The coverage level of the population with municipal waste management services in 2021 was 88.8%, marking an increase of 1.9 % compared to the previous year. During the last decade, the population coverage ratio has been increasing from 51% in 2013 to an average of 66% between 2014 and 2018, jumping to 88% in 2019.

Another important statistic regarding waste management in Albania is the amount of managed waste compared to total waste generated. It reflects the ability of the central government to manage waste. The table below presents the total amount of managed waste both in tons and as % of total waste generated for the period 2016-2021.

Table 1: Waste generation, managed and not managed

	Total generated wastes	Total managed wastes, Ton	Total managed wastes, in %	Not managed wastes, Ton	Not managed wastes, in %
2016	2,211,936	1,300,373	58.8	911,563	41.2
2017	1,817,266	1,253,913	69.0	563,352	31.0
2018	1,523,256	1,172,907	77.0	350,349	23.0
2019	1,201,590	1,086,692	90.4	114,898	9.6
2020	1,173,730	1,047,852	89.3	125,877	10.7
2021	955,790	875,105	91.6	80,685	8.4

Source: Institute of Statistics, (2021), author's calculations

As we can see from Table 1, the percentage of not managed waste has been decreasing over the past 6 years. Still, this statistic is not enough to argue about the type of treatment of urban waste. According to the Institute of Statistics, in Albania the most popular method of waste treatment is landfill (78% of total waste managed), followed by recycling (18.7%) and free disposal outside landfill (2.3%). Only 0.9% of total waste managed is managed through energy burning and 0.2% are burned for elimination. Waste constitutes a major challenge to city administrators and urban populations at large.

Public investments fund for urban waste management have been increasing over the past years. Some of the main investment projects with domestic financing for urban waste management have been:

Closure of the existing EKO - Park solid waste disposal site, Durrës

Water treatment plant and layers of the Bajkaj landfill (Sarandë)

Construction of disposal sites for urban waste

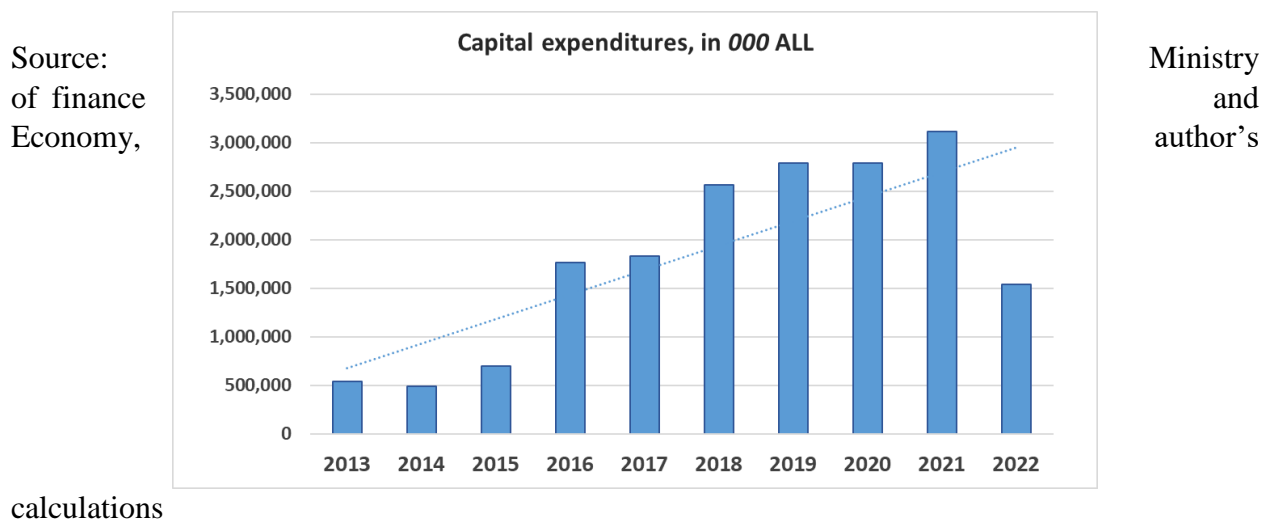
Elbasan incinerator

Energy production plant from waste in Fier

The chart below presents the amount of public investments allocated for the urban waste management budget program during the last decade (2013-2022). As it is clear from the chart, there is a huge jump in the amount of capital expenditures in 2016. This is due to the start of two of the most important projects in waste management: *Elbasan incinerator* (apparatus for burning waste material, especially industrial waste, at high temperatures until it is reduced to ash) and *energy production plant from waste in Fier*.

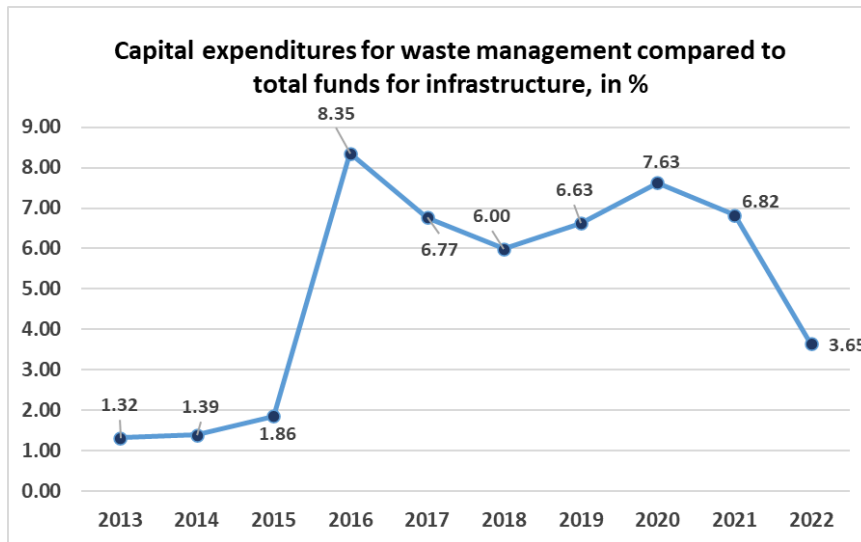
According to the financing data published from the Ministry of Finance and Economy, the main component of public investments for waste management have been the investments in incinerators.

Figure 1: Capital expenditures for waste management in Albania, 2013-2022



The annual amount allocated for both incinerators from 2016 to 2022 is on average 47.7% of the total amount allocated to the whole budget program for waste management, varying from 48.1% in 2020 to 77.3 in 2016. In other words, the main investments for waste management in 2016 were allocated for the two incinerators, 1.3 billion ALL out of 1.7 billion ALL which is the total amount financed for waste management. The total cost of the project investment, VAT excluded, for Elbasan incinerator was around 3 billion ALL, and Fier incinerator was 3.7 billion ALL.

Figure 1: Capital expenditures for waste management compared to total funds for infrastructure, 2013-2022



Source: Ministry of finance and Economy, author's calculations

The chart above presents the public investments for urban waste management compared to the total value of public investments for all the infrastructure projects.

As is clear from the chart, capital expenditure for waste management represent on average 5 percent of the total funds allocated annually for infrastructure. This percentage varies over time between its highest value of 8.35% in 2016 and the lowest value (over 1%) prior to 2016. **This suggests that waste management is not perceived as an “issue” yet by the Albanian authorities.** Most of the funds allocated for infrastructure go for road transport and water supply and sewerage. Waste management is considered an underfinanced budgetary program. The financing of incinerators was followed by many problems. Considering all the problems with incinerators, the Albanian government should shift the focus also in other types of investments for waste management. Controlled landfills can still be a temporary solution for urban waste in Albania. In the meantime, the country can prepare the infrastructure for other types of waste treatment.

Considering the importance that is being given worldwide to the urban waste management, and the future perspective regarding this, the Albanian government also should consider increasing the funds allocated for urban waste management. In the long run the focus should be on the circular economy and alternative ways for waste reduction.

5. Conclusions and recommendations

Generation of waste materials is one of the greatest concerns of the modern world. Waste composition reflects cultural and technological trends and varies greatly between different

continents and regions over time. There are different types of waste treatment and disposal like: landfill, incineration, composting, vermicomposting, open dump. Different countries use different techniques. Most municipal solid waste generated worldwide is still deposited at landfills and waste dumps.

In Albania, most of the total waste generated is urban waste. The percentage of not managed waste has been decreasing over the past 6 years. Still, this statistic is not enough to argue about the type of treatment of urban waste. In Albania the most popular method of waste treatment is landfill, followed by recycling and free disposal outside landfill. Public investments fund for urban waste management have been increasing over the past years. According to the financing data published from the Ministry of Finance and Economy, the main component of public investments for waste management have been the investments in incinerators, which accounted for most of the total budget allocated for waste management. Capital expenditure for waste management represents on average 5 percent of the total funds allocated annually for infrastructure.

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Higher Education and Demographic Changes in Albania: Trends and Perspectives (2004-2028)

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Abstract

The development of higher education in Albania, after the opening of private universities (2004), was accompanied by new and specific phenomena such as the quantitative increase in admission capacities and student's number, reaching the peak in the year 2013. The purpose of this paper is the analysis of this growth and the prediction of the potential demand for higher education in the coming periods based on one of the important factors such as the dynamics of demographic changes of the population. The period of years 2023-2028 is taken as the future period, and to provide the expected changes, their "amplitude" more clearly, the entire period 2004-2028 has been taken into consideration. The paper is based on a descriptive statistical analysis and the data is taken from the publications of the Ministry of Education and Sports, the Institute of Statistics and EUROSTAT. At the end of this paper, results that the increase in the student's number has reached the highest levels in relation to the age group 20-24 years old, also compared to the reports of other countries. Demographic changes will affect the decrease of the student's number in higher education after 2023 by about 14-16% compared to the current year 2022. Both the public and private sectors of higher education have reflected a decrease in the student's number during 2014-2018 and after 2018 the decrease in the public sector has been accompanied by an increase in the private sector. The unfilled quotas in the academic year 2021-2022 were about 25% for the public sector and 30% for the private one, referring to the respective offers for the bachelor level.

Keywords: Higher education, student, population, demographic, growth

Jel Code: I21, I28, Q56

Introduction

The development of higher education in Albania, after the opening of private universities (2004), was accompanied by new and specific phenomena, certainly one of the most distinctive has been its quantitative growth, the increase of the Higher Education Institutions and the student's number. This phenomenon came as a logical consequence of opening the economy as a whole and has been the topic of many analyzes and debates of the entire higher education system, which include many components. This paper is devoted to the analysis of this growth based on a root factor: the dynamics of demographic changes of population. In this aspect, the prospective prediction of the potential demand for higher education in the coming periods would be important. The period of years 2023-2028 is taken as the future period, and to provide the different expectations more clearly, their "amplitude", the entire period of years 2004-2028 is considered. This paper is mainly based on a descriptive statistical analysis and the data is taken from the publications of the Ministry of Education and Sports, the Institute of Statistics and EUROSTAT.

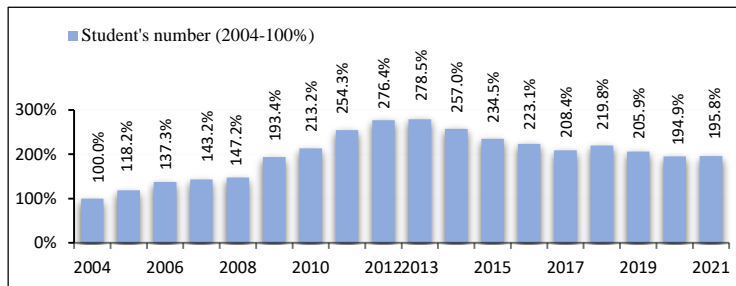
Demographic changes and the growth of higher education

The demographic structure of population undoubtedly plays a significant role in the quantitative changes in higher education, the increase in the number of births in a period also means an increase in the number of young people who will potentially seek to pursue higher studies after 18-20 years. Thus, the increases in population growth in Albania at the end of the '50s and '60s also brought an increase in the student's number during the '70s and '80s, even though in these periods the number of admissions to higher education was limited. The births of the population in Albania suffered a decline, especially in the second half of '80s. However, it was the radical economic and social changes after '91s that brought the democratization of higher education system, and among other things, the increase in the number of young people who could attend higher studies. Initially this increase was significant in public universities, which increased the number of admission quotas, opening universities or subsidiaries of existing ones in many cities. This quantitative change has often been influenced by motives of political campaigns, without planning and in-depth analysis of real possibilities. However, at the beginning of the 2000s, it is evident that the student's number increased significantly, in all cycles of study programs in public universities. After 2004, the opening of the first private higher education institutions, also influenced the increase in the students' number, although initially in small percentages. Thus, despite the decline in births during the 80s, the quantitative growth of higher education after the 90s was significant because of inheriting a strong limitation of opportunities to pursuing higher education.

During 2004-2013 there was an increase to over 2.7 times (278%) in 2013 (Figure 1 and Table 1). After 2013, a continuous decline is observed until 2021, except for 2018 (a significant increase in amplitude). What could this change be related to? Is the situation "saturated" and have the demographic changes, started to affect the decline in the student's number? Other factors may have

had an impact; however, the ongoing paper will exactly analyze this aspect. On the other hand, the question is: does the demographic changes, affect only the student's number that is the quantitative side of the problem? The student's number also is related with human resources, academic staff, financial resources, investments, etc., in this aspect, even for objective reasons, the entire support and perspective of the development of higher education should be reviewed in accordance with the change in the demographic structure of the population. For the public sector, it means that, even with the same budget, the

Figure 1: Increase of the student's number (2004-2021)



Source: INSTAT (2022)

Table 1: The student's number compared to the previous year

Year	Absolute change
2004	10,246
2005	11,490
2006	12,116
2007	3,743
2008	2,533
2009	29,188
2010	12,551
2011	25,962
2012	14,016
2013	1,318
2014	(13,629)
2015	(14,205)
2016	(7,229)
2017	(9,277)
2018	7,210
2019	(8,779)
2020	(6,467)
2021	83

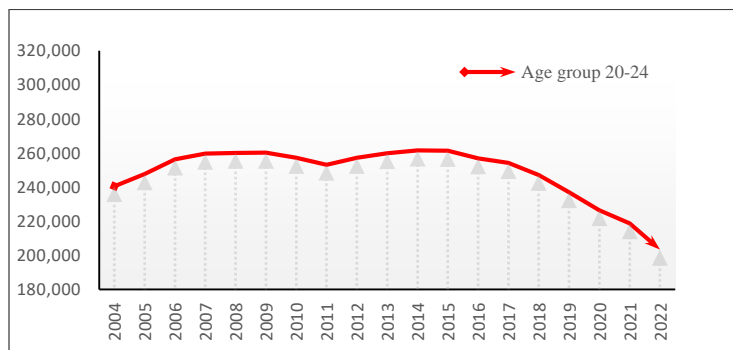
Source: MAS (2022)

support for one student will be acceptable. While for the private sector, the issue is different, it is strongly related to the student's own contribution, thus it is necessary to understand how the "break-even" will be in the future. The effective and qualitative development of private sector necessarily requires a certain demand or students' number. In this aspect, the analysis of the perspective needs to pursue higher studies is directly related to where should be more oriented this sector and what it should aim for.

2. Demographic changes: age group 15-19 and 20-24 years old

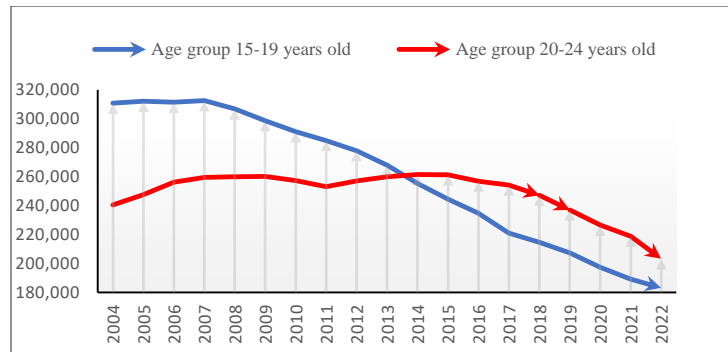
In terms of demographics, the main potential of students in high education is the population age group 20-24. Of course, the student's number also include individuals beyond this age limit. Considering the normal studying age, to point out how the demographic "potential" for pursuing higher education will change, the analyse can begin from the dynamics of population change in the age group 20-24, which is presented in Figure 2. During 2004-2009, the population number (age group 20-24),

Figure 2: Age group 20-24 years old, according to the years 2004-2022



Source: INSTAT (2022)

has been increased: from about 240 thousand (year 2004) to about 260 thousand in 2009. It is noticed a fluctuation during 2010-2015 at about 250 thousand (minimum) in 2011 and about 261 thousand (maximum) in 2015. After the year 2015, a gradual decline of the population age 20-24 is observed, for each subsequent year, estimated from about 261 thousand in 2015 to about 203 thousand in 2022. However, the population age group 20-24, represents the current potential demand for pursuing higher education. While, to analyze the perspective of this demand in the coming

Figure 3: Age group 15-19 and 20-24 years old

Source: INSTAT (2022)

years, it could serve the age group 15-19 (Figure 3). It shows two general characteristics: first, the age group 15-19, is larger in number compared to the age group 20-24, during 2004-2013, while during 2014-2022 the age group 15-19, is smaller in number compared to the age group 20-24, according to the respective years; secondly, it is noted that the age group 15-19 is also characterized by a continuous and significant decrease in its number, from about 311 thousand in 2004 to about 183 thousand in 2022. As the first characteristic can be explained by demographic characteristics or those of the "age pyramid", the second one confirms the fact of the general decrease in the number of young people in the age group before higher education. In absolute measure, this decrease is presented in Table 2. For the age group 15-19, the decline started in year 2006, after a slight upward fluctuation in 2007, it continued with relatively large negative changes until 2022.

Table 2: Changes in the population number compared to the previous year

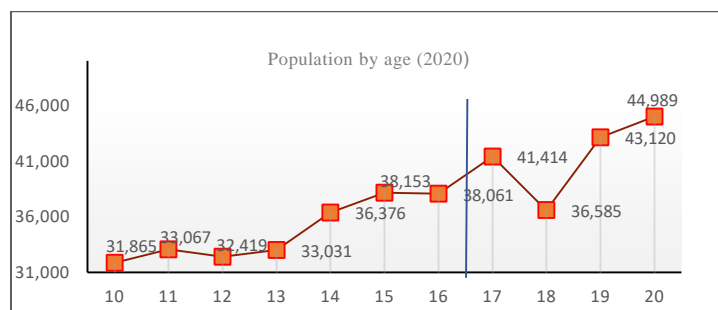
Year	Age-group 20-24	Age-group 15-19
2004	4,750	3,721
2005	1,285	7,066
2006	(660)	8,644
2007	1,137	3,319
2008	(5,718)	485
2009	(8,156)	81
2010	(7,638)	(2,932)
2011	(6,051)	(4,109)
2012	(7,109)	4,050
2013	(9,911)	2,744
2014	(12,584)	1,556
2015	(10,875)	(177)

2016	(9,756)	(4,334)
2017	(13,774)	(2,727)
2018	(6,301)	(7,035)
2019	(7,445)	(10,156)
2020	(9,858)	(10,556)
2021	(8,258)	(7,638)
2022	(5,878)	(15,524)

Source: INSTAT (2022)

The above analysis deals with the dynamics of population change by age group. But to see more clearly the future progress of the demand curve for pursuing higher education, it serves better the number of the population on an annual basis (Figure 4).

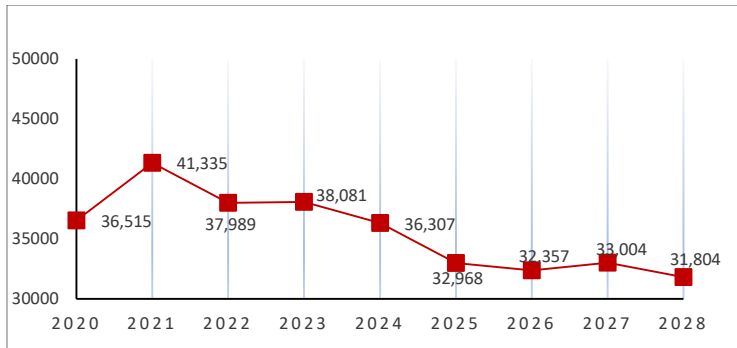
Figure 4: Population age 10 to 20 years old (year 2020)



Source: INSTAT (2022)

This indicator represents the number of the population according to the age for each year and this data are analysed for the year 2020. Looking at the left part of the blue line, it is noticed a decline at the population number under the age of 14 years old (year 2020), so at the age of 13, there were 33,031 individuals; at the age of 12, there were 32,419 individuals, while at the age of 11 it is a slight increase to 33,067 etc., this means that after 4-5 years there will be an easily decline of the population number at the normal age of entering at the university (18-19 years old). However, to have clearer data on the number of young people as a potential opportunity to enter higher education, has been constructed Figure 5. Figure 5 presents the predictions of the population number at the age of 18 during 2020-2028. The data here is based on the

Figure 5: Forecast of the population at the age of 18 years old (2020-2028)



Source: INSTAT (2022)

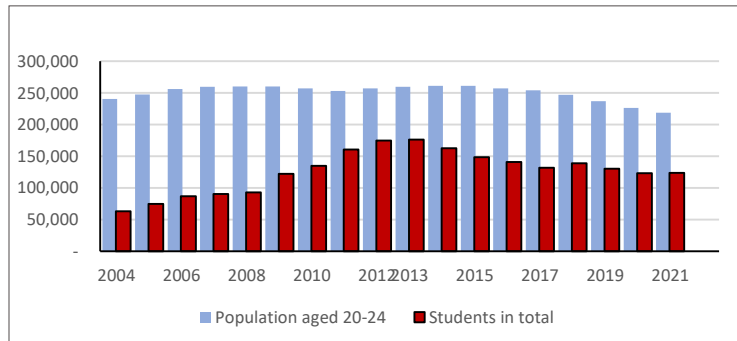
previous Figure 4, but the population number has been shifted by 4 (according to the respective years). A death rate of approximately 0.0019 was also taken into consideration. E.g., starting from the number of the population at the age of 14 in 2020 (36,376), it is predicted that in 2024 the population of 18 years old will be around 36,307. As it is presented in the Figure 5, after the increase in 2020-2021, we expect a continuous decrease during 2022-2028. In this aspect, we can fix two main data: first, it will be evident the decrease in the population number at the age of 18, especially beginning from the year 2022; second, in year 2028 the population of 18 years old will be about 16% lower than in year 2022. On the other hand, not only logically, it is a fact that the increase in the population number at the age of 18 in the years 2020-2021 also corresponds to the increase in the number of students in these years (as will be shown below). So based on demographic factors, it can be predicted that after the year 2023, the drop in demand for pursuing higher studies, will not be significant.

3. Demographic changes and dynamics of student's number: 2004-2028

As shown above, especially after the year 2004, the student's number has grown at a high rate and reached its highest level in 2013, after this year the student's number has presented a significant decline. But how does, the progress and the spaces for significant changes in the demographic aspect, appear? In this perspective, the number of the population age group 20-24 and the student's number in total are presented simultaneously in Figure 6. As it was emphasized, the student's number includes individuals of age-group 20-24, and those beyond this age limit. However, the 20-24 age group is the main source of young people who attend higher studies. In this way, a correlation between the age-group 20-24 of population and the total student's number can be more than logical. The Figure 6 shows that the difference between these two indicators has narrowed

significantly, and this is a result of the increase in the number of students until 2013 and the decrease in the population after this year.

Figure 6: Population age group 20-24 and student's number in total



Source: INSTAT and MAS (2022)

In this sense, it can be said that not only the decline in the number of the population at a young age, but also the development of higher education over the years has reached the "saturation" of demand. In this perspective, it can be analyzed the levels for some countries in terms of the percentage of students aged 20-24 years old, in relation to the population of this age group. In table 3, this index is presented below for several European countries. While in table 4, is presented the approximate value of this index for Albania, based on the total student's number and the population age 20-24. As for the countries studied, the value of this index varies from about 19.7% (Malta) to about 48.6% (Slovenia). While for Albania, the approximate index has increased from 27% in 2004 to 68% in 2012.

Despite the non-identical content of the indices presented, the index for Albania is certainly above that of the analyzed European countries. In this perspective, it can be estimated that the student's number in relation to the population in Albania has reached the upper possible limits.

Table 3: Percentage of student's age-group 20-24 in relation to the population of this age

Country	Year							
	2013	2014	2015	2016	2017	2018	2019	2020
Belgium	38.4	36.2	36.6	36.9	38.8	39.2	39.8	39.9
Bulgaria	35.6	36.1	36.5	36.4	36.2	36.0	36.4	37.3
Denmark	36.6	37.7	38.1	37.6	37.5	37.6	37.8	37.9
Germany	27.3	28.4	29.3	29.2	29.7	30.2	31.7	31.7
Greece	36.0	38.0	40.7	43.0	44.0	46.2	46.2	45.1

Spain	36.0	37.7	38.5	39.1	40.0	40.3	39.8	39.4
France	31.9	32.2	32.5	33.3	34.2	35.2	35.7	35.5
Croatia	37.8	38.8	38.2	38.4	39.3	39.7	39.9	39.4
Italy	32.7	32.0	32.2	31.4	33.1	34.0	34.8	34.2
Hungary	30.7	28.4	26.7	26.0	25.9	26.0	26.3	27.4
Malta	19.7	20.5	20.8	21.6	22.0	22.3	21.7	21.1
Netherlands	35.6	36.7	39.0	38.9	39.5	39.9	40.4	40.8
Portugal	29.0	29.4	29.2	30.0	30.7	31.5	32.6	33.2
Romania	28.4	28.3	28.0	28.1	28.6	29.3	29.5	30.2
Slovenia	47.8	48.6	48.3	46.7	46.0	45.1	44.5	43.9
Finland	35.9	35.1	34.8	34.9	35.0	35.0	35.1	35.2
Sweden	27.1	26.7	26.5	26.6	26.6	27.0	27.2	27.8
Norway	33.7	35.0	35.4	36.1	36.6	37.2	37.5	38.2
Switzerland	26.0	26.5	26.9	26.7	27.1	27.8	28.6	29.4
North Macedonia	21.5	21.7	23.9	24.9	25.2	25.1	19.0	24.4
Serbia	34.0	34.4	34.5	36.3	37.6	37.2	37.0	36.3

Source: EUROSTAT (2022)

Table 4: The percentage of students in relation to the number of the population group age 20-24 years old in Albania

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Coverage	27%	31%	35%	35%	36%	47%	52%	63%	69.1%	68.5%	63%	57%	54%	51%	55%	53%	52%	55%

Source: INSTAT dhe MAS (2022)

4. Offer of admissions to higher education: 2004 - 2021

The above analysis is mainly related to the demand for prospective higher studies based on demographic changes. It is necessary to see how the other side of the problem is: the offer, the opportunities offered to pursue studies, in the public or private sector. As Figure 7 shows the dynamics of the student's number by sectors, it presents an increase, especially in the year period 2008-2013, reaching the peak at about 176 thousand students for both sectors in 2013. After the year 2013, a gradual decline is observed, especially in the public sector. In the last academic year 2021-2022, the number of new students (First level of studies), was about 23,042, which are registered at about 15,919 (+1% compared to last year 2020) in the public sector and 7,123 (+15%) in the private sector. While figure 8 presents the structure of two sectors, where it is noted that until 2011 the weight of the public sector has decreased and that of the private sector has increased. However, in 2021, about 76% of the student's number studied in the public sector, while in the private sector, about 24% (this sector had the largest share in 2011 about 22% and in 2021 about 24%). Another characteristic of the last academic year 2021-2022, related to the offer of higher

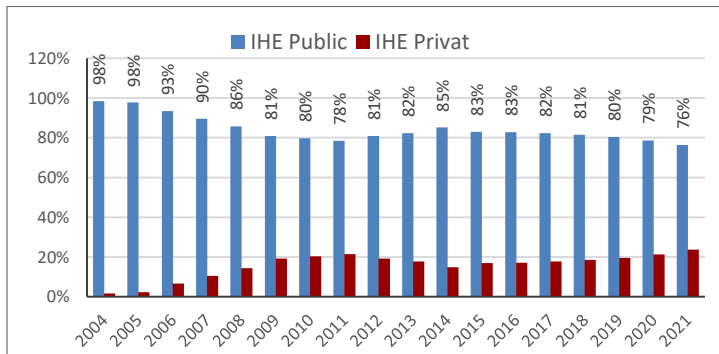
education (admission capacities) as a whole, or even according to sectors, is the number of unfilled quotas. At this year (2021-2022), the number of unfilled quotas

Figure 7: Total students’ number by sectors (2004 – 2021)



Source: MAS (2022)

Figure 8: Total students by sectors % (2004 – 2021)



Source: MAS (2022)

was 5,373 or about 25% of the total quotas in the public sector, while in the private sector 2,996 or about 30% of the total quotas in the private sector, estimated for the first level of studies, bachelor.

Regarding the question of how the structure of higher education in Albania can be considered in terms of the ratio between the public and private sectors, we can refer to the structure in some European countries and the Region (Table 5).

Table 5: Students in higher education by type of institutions (2020)

Country	Total	Private institutions	Public institutions	Private	Private
				government dependant	government independent
Belgium	100%	58%	42%	99.7% **	0.3% **
Bulgaria	100%	13%	87%	0%	100%
Denmark	100%	0%	100%	82%	17.8%
Germany	100%	15%	85%		
Greece	100%	0%	100%		
Spain	100%	24%	76%	9%	91%
France	100%	25%	75%	11%	89%
Croatia	100%	9%	91%	0%	100%
Italy	100%	18%	82%	0%	100%
Hungary	100%	18%	82%	46%	54%
Malta	100%	19%	81%	0%	100%
Netherlands	100%	16%	84%	0%	100%
Portugal	100%	19%	81%	0%	100%
Romania	100%	12%	88%	0%	100%
Slovenia	100%	17%	83%	38%	62%
Finland	100%	47%	53%	100%	0%
Sweden	100%	11%	89%	96%	4%
Norway	100%	16%	84%	39%	61%
Switzerland	100%	16%	84%	49%	51%
North	100%	16%	84%	0%	100%
Serbia	100%	14%	86%	0%	100%

Source: EUROSTAT (2022)

Conclusions and Recommendations

The increase of student's number has reached the peak, related to the age group 20-24 years old, also compared to the reports of European countries.

Demographic changes, most likely, will affect the decrease of the student's number in higher education, especially after year 2023, where the decrease in figures may be 14-16% compared to the current academic year 2022 - 2023.

Both the public and private sectors of higher education have reflected a decrease in the student's number during 2014-2018, however after 2018 the decrease in the public sector has been accompanied by an increase in the private sector.

The "free" capacities in both sectors, public and private, are significant, especially in the private sector where the unfilled quotas in the academic year 2021-2022, were at about 30% of the total offer of the sector (First level of studies).

The forecasts of demographic changes impact on higher education, would place the public sector in more "favorable" positions related to the financial or human resources, as for the private sector it would require a more in-depth analysis of its goal, investment orientation, the market segment where it will operate, etc.

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Albania toward the EU membership, implementing SDG-s

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Abstract

What comes to our mind when we hear the word sustainability? The most common thought is packaging or recycling, or maybe planting trees. But these are all very outdated ideas of what sustainability is. It is about changing the way we use, value and respect natural resources. It is a sophisticated and technical skill set that is quickly becoming a must - have for any successful business, individual or even state.

The SDG era in Albania started based on a long and successful experience of eradicating extreme poverty and reducing the risk of social exclusion, ensuring high quality basic universal education, and promoting gender equality and empowerment of women. Albania has embraced Global Partnership, designed to make a strong contribution to the attainment of Agenda 2030 and is fully committed to implement the Agenda 2030 in the context of the National Strategy for Development and Integration and the European Integration process.

The paper will analyze the Albanian path implementing SDGs, organized in three main categories: economy, society, and environment, taking into consideration the start position and the strategic and institutional frameworks, and the possible implications of the SDGs on the key policy areas in Albania.

Keywords: sustainability¹, development², economy³, circular economy⁴, environmental sustainability⁵

Jel Code: SDGs¹, sustainability², Agenda 2023/3

Introduction

Albania is one of the 192 countries which approved the UN Agenda 2030. A global framework focused on 17 Sustainable Development Goals (SDGs), which has 169 goals and over 230 indicators.

In this context, the Albanian government is committed to pursuing action plans and projects to make the Sustainable Development Goals a reality in Albania, especially now that the EU accession is one of the priorities of the government ruling the country as well as in the context of the National Strategy for Development and Integration (NSDI) and the European integration process.

The Global Partnership for Sustainable Development aims to have the countries which approved the Agenda make a strong contribution to the attainment of Agenda 2030, and Albania is fully committed to implementing Agenda 2030.

The 2030 Agenda aims for a world free of poverty and hunger, with quality education, universal health coverage, achieving gender equality and empowerment of women and girls, and sustainable economic progress and leaving no one behind.

The realization of the SDGs in Albania needs further efforts and considerable commitment, dedication and cooperation of all stakeholders which play a substantial role in the country regarding the SDG achievements.

There are many challenges and obstacles in this process, and one of them is the drafting of the national vision for 2030, on one hand paying special attention to the policy making issues and gaps, and on the other defining the priority areas to accelerate the actions to the successful achievements of the SDG goals in the Albanian context by enhancing the institutional capacities of all the relevant key stake- holders.

Albania has a lot of natural resources to develop tourism, which would lead to more opportunities for Albanians and all the capacities to accomplish most of the SDG goals.

Literature Review

Based on the figures of the Sustainable Development Index for 2022, <https://dashboards.sdgindex.org/profiles/Albania> , published by "Cambridge University Press" report 2022, also with the support of UN agencies, it is observed that Albania ranks in the 61st place with an overall score 71.63 out of 100, among 163 countries in total. Also, Albania's spillover effect, which assesses such spillovers along three dimensions: environmental & social impacts embodied into trade, economy & finance, and security, goes to 93.6 and Albania ranks the 87, which shows that Albania has had positive effects on other countries' abilities to achieve the

SDGs. A higher score means that Albania causes more positive and fewer negative spillover effects.

Compared to the publication of the 2021 report, Albania is ranked 3 positions higher.

The report states that Albania has been on the right track in some of the 17 SDG. Taking measures to combat climate change, eliminating poverty, ensuring affordable, safe, sustainable, and modern energy connections for all are some of the targets where positive changes are observed.

Nevertheless, this ranking shows that it has not made sufficient progress in achieving all the goals for sustainable development.

Figures show that Albania has made little progress, in terms of promoting continuous, comprehensive, and sustainable economic growth, productive employment, as well as decent work for all.

Another objective where Albania lags and is not doing much progress is the conservation and sustainable use of oceans, seas, and marine resources. In addition, in the report it is stated that these are the two main targets which are considered as major challenges for Albania.

If we take into consideration the progress made in the region of Western Balkans, regarding the objectives achievements of the SGG, Albania ranks in the last positions, leaving behind Montenegro.

The methodology used is based on statistical data obtained from the official website of INSTAT, various EU reports.

The Agenda 2030, for Sustainable Development

The 2030 Agenda was launched by the UN Summit in New York on 25-27 September 2015. The main focus of the Agenda is to end poverty in all its forms, and it expects “a world of universal respect for human rights and human dignity, the rule of law, justice, equality and non – discrimination”. The Council of Europe contributes to achieving these goals through most of its sectors through work funded by the ordinary budget as well as with extra-budgetary contributions. SDG number 16 "Peace, justice and strong institutions" is particularly relevant for the Council of Europe, with virtually every sector of the Organization being involved in achieving the goal. The sustainable development agenda is particularly important for the Organization’s development co-operation programs.

The COVID 19 pandemic shook all aspects of human life, spreading human suffering, destabilizing the economy and everything else. This pandemic was (and still is) an unpredicted wake – up call, laying bare deep inequalities and highlighting global weaknesses which are addressed by the 2030 Agenda for Sustainable Development.

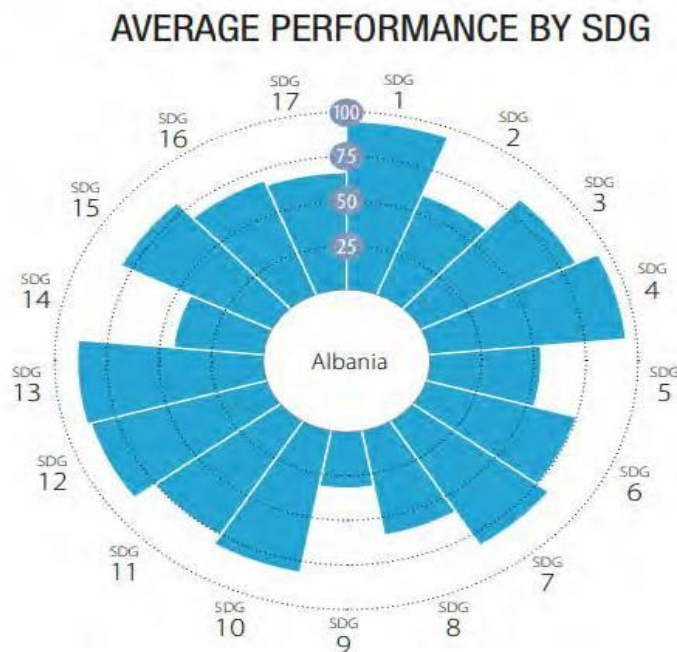
Leveraging this moment of crisis, the 2030 Agenda came at the most perfect time, because it is time for a change, for a profound systemic shift toward a more sustainable economy, that works for both, people, and the planet. The SDGs are vital for the recovery that leads to a greener, more inclusive economies, and stronger, more resilient societies.

Figure 1. SDG Index rank/score/spillover score for Albania



Source: <https://dashboards.sdgindex.org/profiles/albania>

Figure 2. Average performance by SDG for Albania



Source: <https://dashboards.sdgindex.org/profiles/albania>

Goal 1: No Poverty

Sustainable Development Goal 1 (SDG1) aims to eradicate extreme poverty by 2030. Goal 1 focuses on reducing the proportion of population living in poverty, implement appropriate social protection systems, ensure that the poor and vulnerable have equal rights to economic resources as well as access to basic services and reduce the exposure of the poor and vulnerable to climate extreme events and other economic, social, and environmental disasters. In Albania the following indicators show the performance of the Albanian governmental structures to achieve these targets.

The coronavirus disease 2019 (COVID-19) pandemic has put steady progress in poverty reduction over the past 25 years into reverse, with the number of people in extreme poverty increasing for the first time in a generation. Now, rising inflation and the impacts of the war in Ukraine may derail progress further. The combined crises could lead to an additional 75 million to 95 million people living in extreme poverty in 2022, compared with pre-pandemic projections.

Goal 2: Zero Hunger

Sustainable Development Goal 2 (SDG2) aims to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture. In Albania, we have statistics on the following indicators

Target 2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons.

The world is on the verge of a global food crisis, with a rising number of people experiencing hunger and food insecurity even before the COVID-19 pandemic. Global food supply systems have been partially undermined by a cascading combination of growing conflicts, climate-related shocks and widening inequalities. As a result, as many as 828 million people may have suffered from hunger in 2021. The outbreak of war in Ukraine poses an additional threat to food insecurity, with the potential to provoke a surge in levels of hunger and malnutrition, especially among the poorest and most vulnerable. With this global crisis looming, it is more urgent than ever to address its root causes.

Goal 3: Good Health and Well-Being

Sustainable Development Goal 3 (SDG 3) aims to ensure healthy lives and promote well-being for all at all ages. Goal 3 focuses on improving maternal and child health, reducing premature mortality from non-communicable diseases through prevention and treatments and promoting mental health and well-being, ending the epidemics of AIDS, tuberculosis and other communicable diseases as well as reducing death injuries from road traffic accidents.

COVID19 continues to pose challenges to people's health and wellbeing globally and is impeding progress in meeting Goal 3 targets. Before the pandemic, gains were evident in many areas of health, including reproductive, maternal and child health, immunization coverage and treatment of communicable diseases, though progress was marred by huge regional disparities. As of mid-2022, COVID19 had infected more than 500 million people worldwide. The latest estimates show that

global “excess deaths” directly and indirectly attributable to COVID19 could have been as high as 15 million by the end of 2021. The pandemic has severely disrupted essential health services, triggered an increase in the prevalence of anxiety and depression, lowered global life expectancy, derailed progress towards ending HIV, tuberculosis (TB) and malaria, and halted two decades of work towards making health coverage universal. As a result, immunization coverage dropped for the first time in 10 years, and deaths from TB and malaria increased. Urgent and concerted action is needed to set the world back on a trajectory towards achieving Goal 3.

Albania is working hard to achieve this goal, because it is very important not only for the path toward EU membership, but also it would help the society and the Albanian economy.

Goal 4: Quality Education

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. The Albanian Ministry of Education and Sports is mainly responsible for the implementation of the SDG 4 and has as a target 7 goals to be achieved by 2030 in its National Education Strategy.

The seven targets are:

Quality free education for all, for a period of 12 years, of which at least 9 years of compulsory education.

Providing at least 1 year of free and compulsory preschool education.

Equal access to vocational education and higher education.

Employment skills development.

Inclusion and elimination of gender discrimination.

Training of young people for reading and writing and mathematics.

Education for sustainable development and global citizenship.

The COVID19 pandemic has deepened a crisis in education, with severe disruptions in education systems worldwide. School closures have had worrisome consequences for children’s learning and wellbeing, particularly for girls and those who are disadvantaged, including children with disabilities, rural dwellers, and ethnic minorities. An estimated 147 million children missed more than half of their in-person instruction over the past two years. As a result, this generation of children could lose a combined total of \$17 trillion in lifetime earnings (in current value). Governments need to implement ambitious programs to ensure that all children return to school, recover their learning losses, and have their psychosocial needs met.

Goal 5: Gender Equality

The aim is to achieve gender equality and empower all women and girls. In Albania the SDG era started after a long period of transition in social and economic reforms, ensuring quality social services with special focus on gender equality, women’s rights and to build a society where they support and empower the female figure and her importance.

The world is not on track to achieve gender equality by 2030, and the social and economic fallout from the pandemic has made the situation even bleaker. Progress in many areas, including time spent on unpaid care and domestic work, decision-making regarding sexual and reproductive health, and gender-responsive budgeting, is falling behind. Women's health services, already poorly funded, have faced major disruptions. Violence against women remains endemic. And despite women's leadership in responding to COVID19, they still trail men in securing the decision-making positions they deserve. Commitment and bold action are needed to accelerate progress, including through the promotion of laws, policies, budgets, and institutions that advance gender equality. Greater investment in gender statistics is vital, since less than half of the data required to monitor Goal 5 are currently available.

Goal 6: Clean Water and Sanitation

The main goal is to ensure the availability and sustainable management of water and sanitation services for all.

As the pandemic drags on, it becomes increasingly clear that safely managed drinking water, sanitation and hygiene services are vital to human health. But unless progress picks up speed – dramatically – billions of people will still lack these essential services in 2030. Water is fundamental to many other aspects of sustainable development and is under threat. Demand for water is rising due to rapid population growth, urbanization and increasing pressure from agriculture, industry, and the energy sector. Decades of misuse, poor management and the over-extraction and contamination of freshwater and groundwater supplies have exacerbated water stress and deteriorated water-related ecosystems. This, in turn, affects human health, economic activities, and food and energy supplies. Urgent action is needed to shift the current trend. To ensure a sustainable and equitable distribution of water to meet all needs, the average global implementation rate of improved water resources management needs to double. Additional efforts are needed to increase investment in water and sanitation and to further cooperation among countries sharing transboundary waters.

Goal 7: Affordable Clean Energy

The aim of the Albanian government is to ensure affordable and sustainable energy access for all, an aim which is in line with the UN SDG.

The world continues to advance towards sustainable energy targets. Nevertheless, the current pace of progress is insufficient to achieve Goal 7 by 2030. Improvements in energy efficiency, for example, will need to accelerate to reach the climate goal of reducing greenhouse gas emissions. Albania has implemented a project on clean energy, where the government will fund more than 70 % of the investment made by people or businesses in solar panels for clean energy. Hundreds of millions of people still lack access to electricity, and slow progress towards clean cooking solutions means that the health of 2.4 billion people is at risk. Huge disparities in access to modern sustainable energy persist, leaving the most vulnerable even further behind. Achieving energy and climate goals will require continued policy support and a massive mobilization of public and private capital for clean and renewable energy, especially in developing countries.

Goal 8: Decent work and economic growth

The main goal of this SDG is to promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all. Albania's strategic framework alignment with the Agenda 2030 goals and targets is particularly close to this goal primarily through the reforms in PUBLIC ADMINISTRATION.

The pandemic precipitated the worst economic crisis in decades and reversed progress towards decent work for all. Although the global economy began to rebound in 2021, bringing some improvement in unemployment, recovery remains elusive and fragile. Recovery patterns also vary significantly across regions, countries, sectors, and labor market groups. Developed economies are experiencing a more robust recovery, while LDCs, such as Albania, continue to struggle with weak economic growth and labor market fallout due to workplace closures. Many small firms, particularly those in low- and lower-middle-income countries, are especially disadvantaged, with limited capacity to remain viable.

Goal 9: Industry, innovation, and infrastructure

The main aim of the Albanian government is in line with the main aim of the UN agenda for 2030, to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Urban renaissance, the urban transformation of the main cities in Albania is one of the key reforms of the Albanian government.

The pandemic highlighted the importance of industrialization, technological innovation, and resilient infrastructure in building back better and achieving the SDGs. Economies with a diversified industrial sector and strong infrastructure (e.g., transport, Internet connectivity and utility services) sustained less damage and are experiencing faster recovery. In 2021, global manufacturing rebounded from the pandemic, although the recovery remains incomplete and uneven. In LDCs, recovery has been sluggish and remains uncertain; almost one in three manufacturing jobs was negatively impacted by the crisis. Women, youth, and low- and middle-skilled workers suffered the most losses. Overall, higher technology industries performed better and recovered faster, providing a strong example of how important technological innovation is to achieving Goal 9.

Goal 10: Reduced inequalities

The aim is to reduce inequality within and among countries. It is well documented that income inequality is on the rise, with the richest 10 percent earning up to 40 percent of total global income. The poorest 10 percent earn only between 2 percent and 7 percent of total global income.

Before the COVID19 crisis, encouraging signs across several indicators suggested that income inequality was narrowing. In many countries, for instance, the incomes of the poorest people rose faster than the national average, though inequalities in other areas persisted. Now, the effects of the pandemic appear to be reversing any positive trends. Those with relatively low incomes are at risk of falling behind. The pandemic has also intensified structural and systemic discrimination. Emerging markets and developing economies are experiencing slow recoveries, widening disparities in income between countries. The number of refugees worldwide reached the highest

absolute number on record in 2021; sadly, that year also saw a record number of migrant deaths. Meanwhile, the war in Ukraine rages on, forcing even more people from their homes and creating one of the largest refugee crises in recent memory.

Goal 11: Sustainable cities and communities

By 2030, ensure access for all to adequate, safe, and affordable housing and basic services and upgrade slums.

Today, more than half the world's population live in cities. By 2050, an estimated 7 out of 10 people will likely live in urban areas. Cities are drivers of economic growth and contribute more than 80% of global GDP. However, they also account for more than 70% of global greenhouse gas emissions. If well-planned and managed, urban development can be sustainable and can generate inclusive prosperity. However, rapid, and poorly planned urbanization leads to many challenges, including a shortage of affordable housing, insufficient infrastructure (such as public transportation and basic services), limited open spaces, unsafe levels of air pollution, and increased climate and disaster risk. The deep inequalities exposed by the COVID-19 pandemic and other cascading crises further highlight the importance of sustainable urban development. Strengthening the preparedness and resilience of cities, including through high-quality infrastructure and universal access to basic services, is crucial in the recovery phase and in our ability to respond to future crises.

Goal 12: Responsible Consumption & production

Domestic use of environmental materials measures the annual number of raw materials extracted and used in the Albanian economy, plus all physical imports, minus all physical exports. However, the total weight of finished and semi finished imported and exported products is attributed to the single category of raw material which constitutes the largest part of the product.

Unsustainable patterns of consumption and production are root causes of the triple planetary crises of climate change, biodiversity loss and pollution. These crises, and related environmental degradation, threaten human wellbeing and achievement of the SDGs. If we continue the prevailing development pathway, the Earth's finite capacity will be unable to sustain the livelihoods of current and future generations. Transforming our relationship with nature is key to a sustainable future. As the world develops strategies for sustainable recovery from the pandemic, governments and all citizens should seize the opportunity to work together to improve resource efficiency, reduce waste and pollution, and shape a new circular economy.

Goal 13: Climate action

Climate change is a real and undeniable threat to our entire civilization. The effects are already visible and will be catastrophic unless we act now. Through education, innovation, and adherence to our climate commitments, we can make the necessary changes to protect the planet.

The world is on the brink of a climate catastrophe, and the window to avert it is closing rapidly. Increased heat waves, droughts and floods caused by climate change are already affecting billions of people around the world and causing potentially irreversible changes in global ecosystems. To

limit warming to 1.5 °C above pre-industrial levels, as set out in the Paris Agreement, global greenhouse gas emissions will need to peak before 2025. Then they must decline by 43% by 2030, falling to net zero by 2050, according to the Intergovernmental Panel on Climate Change (IPCC), the United Nations body responsible for assessing the science related to climate change. In response, countries are articulating climate action plans to cut emissions and adapt to climate impacts through nationally determined contributions. However, current national commitments are not sufficient to meet the 1.5 °C target. Under these commitments, greenhouse gas emissions are projected to increase by almost 14% over the next decade. Immediate and deep reductions in emissions are needed across all sectors to move from a tipping point headed to climate calamity to a turning point for a sustainable future.

Goal 14: Life below water

The aim of this SDG is to conserve and sustainably use the oceans, seas, and marine resources for sustainable development. Human activity is endangering the planet's largest ecosystem – its oceans and seas – and affecting the livelihoods of billions of people. Continuing ocean acidification and rising ocean temperatures are threatening marine species and negatively affecting marine ecosystem services. Between 2009 and 2018, for example, the world lost about 14% of coral reefs, often called the “rainforests of the sea” because of the extraordinary biodiversity they support. The oceans are also under increasing stress from multiple sources of pollution, which is harmful to marine life and eventually makes its way into the food chain. The rapidly growing consumption of fish (an increase of 122% between 1990 and 2018), along with inadequate public policies for managing the sector, have led to depleting fish stocks. Combating the decline in ocean health requires intensified protection efforts and the adoption of solutions for a sustainable blue economy. This includes a “source-to-sea” approach that directly addresses the links between land, water, delta, estuary, coast, nearshore and ocean ecosystems in support of holistic natural resources management and economic development.

Goal 15: Life on land

This SDG's aim is to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss, which is also one of the priorities of the Albanian government.

Healthy ecosystems and the biological diversity they support are a source of food, water, medicine, shelter, and other material goods. They also provide ecosystem services – the cleaning of air and water, for example – which sustain life and increase resiliency in the face of mounting pressures. Nevertheless, human activities have profoundly altered most terrestrial ecosystems: around 40,000 species are documented to be at risk of extinction over the coming decades, 10 million hectares of forest are being destroyed each year, and more than half of key biodiversity areas remain unprotected. To prevent and halt the degradation of such ecosystems, many countries are sustainably managing their forests, protecting sites critical to biodiversity, and enacting national conservation legislation and policies.

Goal 16: Peace, justice, and strong institutions

The main aim of this SDG is to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels.

Pleas for global peace are growing louder as the world witnesses the largest number of violent conflicts since 1946, with one quarter of the global population living in conflict-affected countries at the end of 2020. Amid these crises, and despite movement restrictions prompted by COVID-19, forced displacement has continued and even grown. As of May 2022, a record 100 million people had been forcibly displaced worldwide. This staggering number will increase along with the widening repercussions of the war in Ukraine. The cost of war and conflict is high, affecting the poor and vulnerable the most and leading to global impacts and escalating human rights violations and humanitarian needs. Exercising fundamental freedoms in the defense of others remains deadly, with 320 fatal attacks against human rights defenders, journalists and trade unionists recorded in 35 countries in 2021. Ending armed conflicts, strengthening institutions, and enacting inclusive and equitable legislation that protects the human rights of all persons are necessary preconditions for sustainable development.

Goal 17: Partnerships for the goals

The main goal is to strengthen local resource mobilization, including international support to developing countries, to improve domestic revenue and tax collection capacity in Albania.

Many developing countries are struggling to recover from the pandemic despite a record-high level of official development assistance (ODA) and a strong rebound in global foreign direct investment (FDI) and remittance flows. Among other challenges, developing countries are battling record inflation, rising interest rates, and looming debt burdens. With competing priorities and limited fiscal space, many are finding it harder than ever to recover economically. With the pandemic far from over and stark disparities in vaccine distribution among countries, there is also the threat of a “two-tiered” COVID-19 recovery. To build back better from the pandemic and rescue the SDGs, a full-scale transformation of the international financial and debt architecture will be required. The world is facing a multitude of crises across the social, health, environmental, and peace and security spectrums. To find lasting solutions, international cooperation must be scaled up – urgently. To stay ahead of crises, significantly more investment in data and statistics will be necessary.

Conclusions

Albania has a lot of natural resources to develop tourism and economy, which would lead to more opportunities for Albanians and all the capacities to accomplish most of the SDG goals.

The realization of the SDGs in Albania needs further efforts and considerable commitment, dedication, and cooperation of all stakeholders, which play a substantial role in the country, regarding the SDGs achievements.

To be part of EU membership, Albania must promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels.

Albania should be focused on improving maternal and child health, reduce premature mortality from non-communicable diseases through prevention and treatments and promote mental health and wellbeing.

Commute in a sustainable way – bike, walk or take public transport. Save the car trips for when you've got a big group.

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The Relationship Between Green Marketing Adoption and Business Size: Evidences from e-commerce sector in Albania

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Abstract

The development of information technologies and the internet has caused one of the most significant changes in the business environment over the last decade. Companies have evolved to adapt to a digital environment influenced by internet business models and digital marketing techniques. More and more firms and enterprises around the world are responding to consumer higher sensitivity regarding the protection of environment and need by either embracing circular economy models or adopting strategies of green marketing. These strategies may range from eco-friendlier supply chains, green packaging, environmentally friendly products or promoting broader efforts to reduce environmental impact. The current paper analyzes such strategies by using background cases that inform the primary Albanian case, to understand how fast the Albanian e-commerce companies are catching up with this environmentally friendly business models and how green marketing may help. The purpose of this study is to determine the level of green marketing adoption among Albanian E-businesses and to investigate the impact of business size on green marketing adoption. The research model was tested with national survey data collected from Albanian e-commerce firms of different business size. The present study opens broad horizons for the exploration of green marketing strategies in the e-business proactiveness and the impact on e-business agility in responding to environmental uncertainty. This this study shows that future-oriented companies can profit economically while reducing their negative environmental impact.

Keywords: E-business, green marketing, sustainable marketing, business size, Albania

Jel Code: M, O, Q

I. Introduction

Sustainability and environmental issues are among the most pressing concerns for modern humanity, governments, and environmentally conscious consumers (Hsu et al, 2013). It should be noted that business activities, including marketing, play a role in enhancing sustainable development. According to Polonsky (1997), marketing as a business function must ensure that future generations' ability to meet their needs and desires is not jeopardized. On the other hand, Robert (2011) contends that sustainable development necessitates sustainable marketing strategies

that are both competitive and environmentally sustainable. As a result, marketing's role in development has been significantly reorganized (Kotler, 2019).

In recent years, economic performance has needed to be balanced against environmental and social performance. Within the input process of innovation generation, activities related to demonstrating the resources on a country's requirement to produce goods and services, as well as increasing unwanted products in the form of waste and pollution, are included.

Albania was ranked in the 79 places among with 118 country that had the worst air quality in 2021 (IQAir, 2022). According to the report published in 2020 by the “European Environment Agency”, Albania has second highest rate of pollution related with deaths in Europe. Albania found itself second on the “worst countries” list, after Bosnia and Herzegovina. Noted in the report Albania has 23% of recorded deaths due to environmental matters, it is 10 percentage points higher than the European average. Factors impacting the big disparity include lower sanitation levels and higher exposure to waste substances that are detrimental to health and life expectancy. The Numbeo Pollution Index ranked Tirana as the third most polluted city in Europe in January 2020. Despite the fact that Albanian's national strategy has focused on promoting green growth and sustainable development, it has only achieved a limited level of success due to a lack of implementation. This is due to the lack of good governance and integrated partnerships aimed at mutual growth in the economy, environment, and quality of life. Furthermore, due to a lack of collaboration, Albanian public policy intervention is ineffective in extending the socioeconomic benefits of green practices. As a result, it places severe constraints on business and policymakers in terms of eco-innovation policy and strategy.

As a result, there is a growing need to transition to a green economy for eco-friendly driven innovation, also known as eco-innovation. This includes new products, processes, and management solutions that have a lower environmental impact. There is a number of studies highlighting the importance of green management practices (for example, Cherrafi et al. (2018), Liu et al. (2017), and Ma et al. (2018)). Cooperation with supply chain partners (Cherrafi et al., 2018); environmentally friendly operations (Liu et al., 2017); and internal management and support (e.g., internal efficiency demand) are three key elements of green management practices (Ma et al., 2018).

This research undertakes an evaluation from e-commerce sector in Albania in order to understand the relationship the relationship between green marketing adoption and e-business size. A business would adopt green marketing practices due to internal and external forces, according to Kirchoff et al (2016). Nonetheless, Dardan et al. (2007) contend that the adoption of certain innovations is influenced by the size of the business. Businesses with sufficient resources, such as skilled human resources, technology, and financial resources, will be able to adopt new innovations more quickly and completely than smaller businesses. According to Zhu and Sarkis (2006), organizational size is more important for the adoption of green practices and has an impact on organizational performance (Choi et al,2001). According to some findings, large businesses are in a position to adopt green marketing practices due to their resource capacity (Mitra and Data, 2014). Furthermore, large businesses are more influenced by government pressure to adopt green practices than small businesses (Vachon and Klassen, 2006). Nonetheless, a study conducted in

China by Zhu et al (2008) discovered that organization size plays a positive role in the adoption of green practices. Unfortunately, the findings on the influence of organization size on green marketing adoption are mixed. Furthermore, there is a scarcity of literature and research reports in Albania on the size of businesses and the intensity of green marketing adoption. This inspires me to conduct research on the relationship between business size and green marketing adoption intensity in e-commerce sector in Albania. As a result, the two main purpose of this study are: to determine the level of adoption of green marketing practices and to investigate the relationship between business size and level of green marketing practice adoption. To date, there is no empirical research on the combined characteristics between business size and green marketing adoption intensity in e-commerce sector in Albania. This study will be the first exploratory research in the field.

The following is the structure of the paper: first, a literature review outlines the concepts used and the model developed in this study; second, I explain the methods and data collection process. Finally, I present my analysis of the results and conclusions. Implications and recommendations for further research are also discussed.

II. Literature Review

Because the research topic under consideration in my paper is related to green management practices, green marketing adoption and business size. In the following subsections, I will conduct a critical review of the literature on these topics. The theoretical framework for this current research will be based on five major streams of literature review: (1) The Concept of Green Marketing Practices; (2) Business Size; (3) Resource based theory; and (4) E-commerce sector in Albania and (5) Green Marketing Adoption and Business Size

2.1 The Concept of Green Marketing Practices

According to the American Marketing Association, green marketing refers to the marketing of environmentally friendly products. Thus, green marketing encompasses a wide range of activities, such as product modification, changes to the manufacturing process, packaging changes, and modifying advertising. Environmental marketing and ecological marketing are two other terms that are used interchangeably. Thus, "Green Marketing" refers to a holistic marketing concept in which the production, marketing, consumption, and disposal of products and services are done in a way that is less harmful to the environment. With increasing awareness about the implications of global warming, non-biodegradable solid waste, the harmful impact of pollutants, and so on, both marketers and consumers are becoming increasingly sensitive to the need for a shift to green products and services. While the transition to "green" may appear to be costly in the short term, it will undoubtedly prove to be indispensable and cost-effective in the long run.

Green marketing practices vary, but the majority of them revolve around the traditional marketing four Ps: green product, green pricing, green promotion, and green distribution (Polonsky 1994; Kinoti 2011). Various researchers have reported on various green practices that most businesses have adopted. According to Polonsky (1994), green marketing practices include product modifications, changes to manufacturing methods and processes, and changes to advertising and packaging. To generate attention and demand for sustainable products, effective green marketing

practices must be based on green packaging, green branding, labeling, and advertising (Juwaheer et al 2012). Interestingly, Sarkar (2012) agreed that green marketing encompasses a wide range of activities, including product modification, packaging, changes to the manufacturing process, remodeling and developing a new style, and relying on advertisements that promote green consumption. The green marketing practices proposed by Polonsky (1994) and Kinoti (2011) were examined for the purpose of measuring the level of green marketing adoption in this study.

Furthermore, the level of adoption of green marketing practices is determined by the number of practices implemented.

2.2 Business Size

The scale of organization and operations of a business enterprise is referred to as its business size. Depending on their level of development, different countries use different measures of size. The most commonly used indices are total employee count, total investment, and sales turnover. Businesses are classified into four categories in Albania development policy of 2022: micro, small, medium and big enterprises as specified in table 1:

Table 1: Businesses classification in Albania

Classification	Number of employed persons	Annual Sales Revenues (ALL)
Micro-enterprise	1 – 9	A total annual balance not exceeding ALL 10 million
Small Enterprise	10 - 49	A total annual balance not exceeding ALL 50 million
Medium Enterprise	50 -249	A total annual balance not exceeding ALL 250 million
Big Enterprise	Over 250	A total annual turnover grater than ALL 250 million

Source: Own elaboration based on the information generated by <https://www.tatime.gov.al/c/6/legjislacioni>.

It should be noted that SMEs are regarded as the engine of innovation and sustainable development. They may be able to solve societal and environmental issues (Kardosa 2012).

Regarding the e-commerce sector in Albania, a serious problem is informatization. Small businesses start with personal, family acquaintances, they start selling basic things and then with the increase in flow forces them to legal register, focus on digital marketing, contract for distribution. As stated by the director of the Albanian E-commerce Association in 2021, every day 17,000 – 20,000 orders are delivered by postal companies to customers, where less than 30% belong to companies

operating legally in the market. The biggest challenge remains the formalization of the market, the opening to global markets and the development of this sector according to professional standards. According to QKB the ecommerce sector in Albania is dominated by SMEs

2.3 Resource based theory

According to resource-based theory, in order for a business to be and remain competitive in a market, it must seek out and protect its unique resources (Barney & Warnerfelt, 1995). According to Dowel and Heart (2011), in order to remain competitive, a business must seek, protect, and use both intangible and tangible resources. In that sense, if resources are made available in the required capacity and used in an effective and efficient manner, business success is assured. According to resource-based theory, business characteristics, particularly the availability of critical resources, can influence the levels of green practice adoption (Uhlaner et al.2012). This is due to the fact that the available resources will be used to add more unique and inimitable resources, allowing a business to remain powerful and competitive. Recent research suggests that a proactive environmental strategy can help to bridge the gap between a company's environmental capabilities and its competitive advantage (Chan, 2021; Mishra & Yadav, 2021). Higher-order resources, such as accurate business forecasts and strategic planning, can provide a firm with a long-term competitive advantage through its operating resources, which include specialized manufacturing plants, brand names, loyal customers, and patents (Wibbens, 2019). In the context of SMEs, larger firms are more likely to engage in sustainable practices because they have more resources and stakeholder influence than small businesses (Uhlaner et al. 2012; Lynch-Wood and Williamson 2014). As a result, the study draws on theory to consider that a business with sufficient resources has the potential to invest in more unique resources such as green technology, which in turn helps a business to be more competitive and achieve sustainable development. They may be able to solve societal and environmental issues (Kardosa 2012).

2.4 E-commerce Sector in Albania

Online sales have recently increased in Albania. Businesses are selling more online as technology advances and social networks spread, although in an unorganized manner. Both market participants and postal operators report an increase in delivery volume in 2022. Informality and the widespread use of cash in the economy continue to be issues. The major market participants anticipate that the positive performance will continue based on two main arguments. First, they target customers between the ages of 17 and 35 as a target group who return to their online shopping experience. Second, as technology advances and the use of smartphones increases, consumers are becoming more prone to this consumer behavior.

As showed in a survey by statistics office Instat in December 2021, the number of Albanians making online purchases continued to increase in 2021, with 21.4% of the population aged 16-74 saying they had made an online purchase in the preceding 12 months. The main cities in Albania where e-commerce takes place are mainly Tirana, Durres, Elbasani, Korça, Shkodra, Fieri and Vlora. Social networks are widely used by businesses to increase their activity. According to data from Instagram (2021), in just one month, about 90 million accounts have clicked on the post of a certain product to learn more details about it.

Informality is very high in the Albania's online sales. Informality is prevalent among online sales operators, who claim that because of the opportunities provided by online operations, many people avoid fiscal obligations. Most delivery services in Tirana are provided by unlicensed individuals. Cash-on-delivery accounts for nearly 90% of all online sales. All market participants claim that if they only accepted online payments, none of them would be able to compete. The lack of an entry barrier in the e-business has made that a lot of new e-business are being created each day.

According to European E-Commerce Report in 2021, Albania is the country with the lowest percentage of online purchases compared to the countries of the European Union and candidates for membership. According to this report, 85% of respondents stated that they have not made online purchases and 15% that they have made online purchases. Among the candidate countries, Macedonia has the lowest percentage of online purchases after Albania, where only 25% of respondents stated that they made online purchases. In Montenegro, Serbia and Turkey, the percentage of online respondents who stated that they have made online purchases varies from 31 to 34%. The average of respondents in the European Union who stated that they have made online purchases is 67%.

2.5 Green Marketing Adoption and Business Size

The size of the company is one of the internal variables that influence the adoption of green marketing practices. The levels of adoption of green practices are influenced by business characteristics, specifically the availability of critical resources (Uhlener et al.2012). The size of the business influences the adoption of certain innovations (Dardan et al.2007). Companies with sufficient resources, such as skilled human resources, technology, and financial resources, will be able to adopt new innovations more quickly and completely than smaller companies. According

to Zhu and Sarkis (2006), organizational size is more important for green practices adoption and has an impact on organizational performance (Choi et al,2001).

According to some findings, large businesses are better positioned to adopt green marketing practices due to increased resource capacity (Uhlener et al. 2012; Lynch-Wood & Williamson 2014; Mitra & Data, 2014; and Singh et al. 2014). Furthermore, large businesses, as opposed to small businesses, are more susceptible to government pressure as they adopt green practices (Vachon & Klassen, 2006). Nonetheless, a study conducted in China by Zhu et al (2008) discovered that organization size plays a positive role in the adoption of green marketing practices. However, from another perspective, a large business will be less benefited by structural inertia, as they are less agile and flexible than small businesses (Sulaiman, et al 2015). Due to its management structure, making decisions takes a long time. Even if small businesses are limited in terms of technology and financial resources, they will be more active and quicker to adopt and meet market demands (Zhu et al, 2006). Furthermore, the findings of the green marketing studies conducted by Ofunya (2012) and Durmaz & Yaşar (2016) show that green marketing adoption is influenced by regulations, customer and consumer pressure, corporate social responsibility, increasing emphasis on environmental issues, firm's reputation, performance, market share, and competitive advantage.

While authors such as Zhu and Sarkis (2006) and Zhu et al (2008) acknowledge that business size influences the level of green marketing adoption, other studies such as Zhu et al (2006) and Vachon &Klassen (2006) argue that small and large businesses have an equal chance of adopting green marketing practices. Thus, the purpose of this research is to determine the level of green marketing adoption among e-businesses and to investigate the impact of business size on green marketing adoption in Albania.

III. Tools and Methodology

The study used a descriptive design with a survey study approach, with data collected from 120 micro, small, medium and big enterprise who have a website or online marketplace in Albania. Simple random sampling from different e-commerce businesses was used, which ensures approximate independence of observations.

The sample was obtained through the use of a purposive sampling technique, which was viable due to the inability to obtain a reliable database from QKB. This source was used to check e-commerce information before conducting a field survey study to test the proposed hypotheses.

This study seeks to answers the following major questions:

Question 1: What is the level of adoption of green marketing?

Question 2: Does the size of the business influence the level of adoption of green marketing?

The size of the e-commerce company was defined based on annual sales revenues (ALL) declare during the survey. According to Baker (2003), the study sample should include people who have access to the information that the research seeks. To avoid complacency, respondents focused on top positions involving their firms' strategic orientation. To achieve the desired results, business owners, marketing managers, and operations managers were used as units of inquiry.

A questionnaire was used to collect data. Data were collected during November 2022 using telephone survey. Following that, data was analyzed, and a chi square was used to test the relationship between the dependent variable (Adoption level of Green Marketing Practices) and the independent variable (Business size). Table 2 presented bellow represent the characteristics of the sample.

Table 2. The characteristics of the sample

Demographic of the sample	Number of firms (n = 120)	Percent (%)
<i>(a) Firm age</i>		
0–2 years	10	8.4
3– 5 years	43	35.8
6–8 years	37	30.8
9–11 years	18	15
Above 12 years	12	10
<i>(b) Respondents' position</i>		
CEO, Entrepreneurs, Business owners, managers, or other top or middle positions	120	100
<i>(c) Type of industry</i>		
Food & beverage/Agriculture	4	3
Medical devices & pharmaceutical	8	6
Auto parts and Machinery	3	2
Retail/wholesale	58	50
Electronics	25	21
Others	22	18

Source: Own elaboration

IV. Findings

This section includes the findings regarding business size, green marketing adoption level, and the relationship between green marketing adoption and business size.

4.1 Business Size

Business characteristics in terms of size was captured during the study defined by the number of employees and annual sales revenues. The size of the business ranged from Micro, Small, Medium and Large Business. Table 3 shows the number of businesses in their respective business categories. This indicates that the business sizes categories are normally distributed between small, medium and large business therefore was suitable for me to run a chi square test against the level of adoption (high and low) to test its association.

Table 3. Business Size

Business Size	Frequency	Percent
Micro Business	3	2.5
Small Business	40	33.3
Medium Business	39	32.5
Large Business	38	31.7
Total	120	100.0

Source: Own elaboration

4.2 Adoption of Green Marketing Practices

Respondents from e-commerce sector were asked to indicate whether they adopted or did not adopt the twelve practices recommended by Polonsky (1994) and Kinoti (2011) in order to establish the set of green marketing practices in their business. Table 4 shows the composition of the twelve green marketing practices in Albania e-commerce sector.

Table 4. Green Marketing Practices Composition by Adoption Counts

Green Marketing Practices	Status	Count(n*)
Production of eco-friendly products	Practicing	5
	Not Practicing	115
Use of eco-friendly Packages	Practicing	71
	Not Practicing	49
Water recycling	Practicing	0
	Not Practicing	120
Use of Clean energy/Renewable (gas, biogas, solar etc.)	Practicing	0
	Not Practicing	120
Charging higher Price for Green Products	Practicing	112

	Not Practicing	8
Green label usage	Practicing	55
	Not Practicing	65
Promotes Green Lifestyle	Practicing	71
	Not Practicing	49
Promotes the Benefits of Green Products	Practicing	75
	Not Practicing	45
Promotes Green Image of the Product	Practicing	53
	Not Practicing	67
Reverse Channel system (Collecting wastes for recycling)	Practicing	2
	Not Practicing	118
Use of Economic and energy efficiency Transport	Practicing	29
	Not Practicing	81
Use of Secondary Packages (Containers)	Practicing	2
	Not Practicing	118

*n-Indicates the number of e-commerce company who adopted and those who did not adopt.

Source: Own elaboration

According to my research findings showed in Table 4, many businesses adopted few green marketing practices because only 5% of the e-commerce businesses produced at least one green product, 59.2% of the e-commerce businesses used green packaging. Nonetheless, many businesses did not adopt green marketing practices such as the use of secondary packages, reverse channel systems, water recycling (0% of businesses), and the use of renewable energy. Because of the high cost of green technology and the low demand for green products, most businesses did not adopt these green marketing practices.

4.3 Green Marketing Practices Adoption

My study's goal was to determine the level of Green Marketing Practice Adoption in e-commerce sector in Albania. The extent of adoption was measured by the number of practices adopted out of 12 practices, as shown in Table 4, with less than or equal to six practices considered low, and 7 to 12 practices considered high, as shown in Table 5.

Table 5. Adoption Frequency Level in Percentage

Business Size	Frequency	Percent
Low Extent (≤ 6 Practices)	103	86 %
High Extent (7 -12 Practices)	27	14 %
Total	120	100 %

Source: Own elaboration

According to my findings, 103/120 businesses (86%) had adopted at least one to six practices which is consider low extent of adoption), while 27/120 businesses (14%) had adopted seven to twelve practices which is consider higher extent. As a result, the level of adoption of green marketing practices among e-commerce businesses in Albania was low, with 86 percent of businesses adopting less than 7 practices of the twelve practices tested. This could be due to capital constraints and low government incentives to favor company that uses green practices.

4.4 The Relationship between Business Size and Adoption Level of Green Marketing

My objective was to identify a link between business size and green marketing adoption level. The two variables, business size and level of adoption, were then tested. The size of the business was determined by the capital invested, as shown in table 2, and the level of adoption was determined by the number of green marketing practices implemented, as shown in table 3 above. The chi square test of independence output from SPSS. The chi square of independence test was used to determine the relationship between business size and adoption level. No cell had a count that was less than 5. Because the assumption was met, the minimum expected count was 12.35. Because the P-value is 0.025, which is less than the significance level of 0.05, the relationship between business size and adoption level of green marketing practices is significant. As a result, the size of a business and the level of green marketing adoption are not independent. Also, it is showed the business size influences the adoption level at the medium level of Phi Value.258.

V. Conclusions and Recommendations

Green Marketing is critical to saving the world from pollution. According to the findings, various green marketing practices were implemented. Few of them were widely used by e-commerce businesses. Green product, use of eco-friendly packaging, and green promotion (promoting a green lifestyle) were discovered to be adopted by many businesses when compared to others. However, green marketing practices such as green process (water recycling, use of green energy), and green place (use of secondary packaging) were found to be less adopted, as fewer businesses adopted these practices than others. Less adopted practices may be influenced by financial factors, as installing green technology is expensive (Kinoti, 2011).

Furthermore, it was discovered that the level of adoption of green marketing practices was low because most businesses adopted relatively few practices, which were less than or equal to six. Medium businesses (those with more capital than small and micro businesses) were found to adopt more practices than small and micro businesses. This could be due to the financial power that

medium-sized businesses have, as Dardan (2007) contends that businesses with sufficient capital have a better chance of going green than those with insufficient capital due to the initial green technology costs associated with going green.

I have discovered also a link between business size and the level of adoption of green marketing practices, with large businesses adopting more practices than medium, small and micro e-commerce businesses. My findings appear to support earlier studies such as Dardan (2007), Uhlener et al (2012), Lynch-Wood and Williamson (2014), Mitra and Data (2014), and Singh et al (2014), which report that a business with adequate resources, including large capital, has a better chance of going green than one with insufficient resources. This is due to the initial financial resources that must be invested at the beginning. Furthermore, it should be noted that the study only focused on e-commerce sector in Albania. Albanian companies cannot report and update information on the performance and compliance of their environmental activities unless green management practices are implemented. Green management for small businesses may instead take the form of other practices such as the 3 R concept (Reduce-Reuse-Recycle), less energy usage, and waste minimization. As a result, green initiatives and management can stimulate innovation and reveal new sources of new products and revenue.

The findings are limited to e-commerce sector and could be applied even in other sector in the Albanian industry. I encourage future research into multilevel time series models with applications to repeated measures data. In order to specify causality by reaching pre- and post-behavioral interpretation. Finally, due to the nature of green management practices, I cannot test them in a nonlinear relationship. Future research could use the curvilinear function to assess the effectiveness of green management practices in e-commerce sector in Albania.

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Inflation and its impact on the Albanian economy during the last decade

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Abstract

Economic growth harmonized with a stable level of inflation is the main economic development objective of a country. The impact of inflation on the economy is the subject of many different studies. The development of the Albanian economy and of the inflation rate during the last decade coincides with important events with significant impact on the economy, such as the recent financial crisis, the effect of the pandemic and the economic crisis resulting from the war in Ukraine. Although there are several main factors that affect economic growth, the focus of this paper is the impact of inflation on economic growth. The relationship between inflation and economic growth is controversial and is a subject of many studies. An acceptable level of inflation has been a cause for concern not only for Albania, but for the economies of many countries in the world. The analysis of the impact of inflation takes significant importance today given the economic developments of recent times, the result of unforeseen political, economic and social events for Albania. Based on quarterly data of the last decade (2012-2022) we have constructed the econometric model on which we have presented the main hypotheses. The variables include economic growth (dependent variable), the inflation rate and the growth rate of direct foreign investment, as among the main influences on economic growth (independent variables). The result of the study indicated a negative relationship between economic growth and inflation. The relationship of causality was also statistically proven, which showed that inflation has an impact on economic growth.

Key words: Inflation, economic growth, prices, statistical series, foreign investments.

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Introduction

The harmonization of the achievement of price stability, as the main object of the Bank of Albania, is closely related to the sustainable growth of the economy. This is also the focus of policy makers during the last decade. As a result, inflation has been and remains one of the most studied indicators during the last decades. Researchers have reached different conclusions in the study of the relationship between inflation and economic growth. Many researchers have addressed the factors that influence the inflation rate related to the economic growth indicator. The results of the impact of inflation on economic growth in many studies have been different. The period under study coincides with the phase of overcoming the last financial crisis (2012) and the impact of specific events for the Albanian economy (the 2019 earthquake), the pandemic period and the impact of the war in Ukraine (2019-2022).

High inflation can lead to uncertainty about the future profitability of investment projects. This leads to a decrease in the level of investments, or it can decrease the country's international competitiveness, making its exports relatively more expensive, thus affecting the balance of payments. Examples at the theoretical level are defined. In empirical research, this ratio is not always the same. Numerous studies have been conducted, which specifically aim at examining the relationship between inflation and economic growth, which obviously depends on the nature and structure of the economy. The current study aims at assessing the impact of inflation on the economic growth in Albania during the last 10 years. In this respect, the paper, in addition to the analysis of the development of inflation, as captured by the Consumer Price Index (CPI) in years, will focus on its impact on the economy, concluding on the characteristic features of this impact.

Conceptual framework and literature review

Many theoretical discussions of inflation include classical, Keynesian, monetarist, Neoclassical theories of endogenous growth, etc. In addition to theoretical analysis, a series of empirical studies show the relationship between inflation and economic growth in the medium and long term.

Fisher (1993) has studied the relationship between inflation and economic growth. His paper confirms the negative impact of increasing inflation rate on investments and thus the reduction of economic growth.

Barro (1997) - in his study used the regression model, concluding that an increase in inflation of 10% per year leads to a decrease in the growth rate of real GDP per capita by 0.2%-0.3% per year.

Khan and Senhadji (2001) - divides the study into two areas, separately for industrial and developing countries. They used new econometric techniques with data containing 140 countries for the period 1960-1998. The threshold value where inflation affects negatively is lower for industrialized countries than developing countries. Respectively 1-3% for industrialized countries

and 11-12% for developing countries. Below the defined level, the effect on economic growth is negligible.

Mubarik (2005)- evaluated the threshold level of inflation for Pakistan, where he found that the level of inflation above 9% negatively affects economic growth, but inflation below the predicted level is conducive to economic growth.

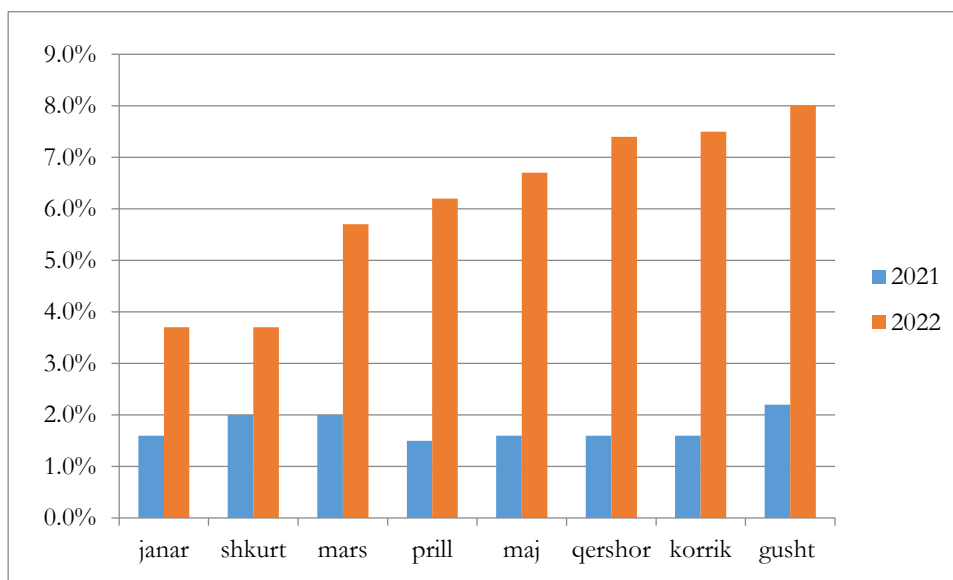
Datta (2011) in his paper presented data from 1971-2007. The findings showed that there is a short-term causal period and the direction is from inflation to economic growth. Opposite conclusions among other researchers indicate the lack of interdependence between these two variables.

Kigume (2011) studies inflation and economic growth in Kenya from 1963-2000. The test of this study revealed that there is no causal relationship.

Analysis of inflation progress in Albania

Bank of Albania, as the preparer and implementer of the monetary policy, has as its main objective the achievement and maintenance of price stability at the level of 3% with a possibility of $\pm 1\%$ fluctuation. The period 2000-2010 is characterized by a moderate indicator of the inflation rate with a more visible fluctuation due to the impact of the global financial crisis of 2007-2009. Subsequently, the period 2011-2021 is characterized by a stability of the inflation rate, below its target level of 3% by the Central Bank. The impact of the earthquake (2019) and the pandemic period (2020-2021) did not result in the deterioration of the inflation indicator because of the lack of growth in aggregate demand. The impact of the Russia-Ukraine armed conflict had the effect of a rapid increase in the CPI indicator during 2022, mainly as a result of imported inflation (energy crisis, the price of oil in world markets, etc.)

The table below shows the elevated rate of inflation during 2022 compared to the same period last year.



Source: *Institute of Statistics (INSTAT), September 2022, Tirana Albania.*

The increasing trend in inflation indicator continued even in the following two months. Thus, for the months of September and October, the CPI on an annual basis is 8.1% and 8.3%, respectively.

Based on the growing progress of the inflation indicator, Bank of Albania has increased the base interest rate several times this year with the aim of stopping the further increase in inflation rate.

Data Collection and Method

In accordance with the purpose of the study, an analysis of the inflation impact was made in the theoretical framework and the analysis was extended on actual statistical data. To examine the impact of inflation on economic growth, an econometric model based on the relevant literature was used. Primary data were used, where the main source was the Institute of Statistics and the Bank of Albania. The data we used was quarterly data covering the last 10 years. As variables of the model, inflation (CPI) was taken as the main independent quantitative variable, the economic growth rate (GDP) as the dependent quantitative variable and the foreign investment growth rate (FDI) as the second independent quantitative variable.

Data analysis and processing was carried out through the linear regression model:

$$Y = C_1 + C_2 * X + C_3 * Z$$

Where Y is the dependent variable (in our case GDP), X and Z represent the two independent variables, respectively CPI and FDI, C₁ is a constant and C₂, C₃ represent the regression coefficients.

The hypotheses of our study are:

H₁: There is a negative relationship between inflation and economic growth

H₂: There is a cause and effect relationship between FDI growth and economic growth.

The tests resulted in a model that expresses the relationship between economic growth, inflation and the growth of foreign direct investments:

$$Y = 4.50052367302 - 0.632667557194 * X + 0.164024768104 * Z$$

Based on the results obtained from the model, we see that both hypotheses presented before are true:

- There is a negative relationship between inflation and economic growth. A one percent increase in inflation reduces economic growth by 0.6 percent when all other factors remain unchanged.
- There is a cause and effect relationship between FDI and economic growth. An increase in foreign direct investment by one percent positively affects economic growth when all other factors remain unchanged.

The independent variable - inflation (VIF=8.2) is not affected from multicollinearity. The second variable - FDI is affected from multicollinearity (VIF=25.6) but due to the explainability of the model it is significant in testing.

The presentation of the econometric model is as follows:

Dependent Variable: Y
 Method: Least Squares
 Date: 09/21/22 Time: 10:24
 Sample (adjusted): 2012Q1 2022Q1
 Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.500524	3.233779	1.391723	0.1721
X	-0.632668	0.500788	-1.263344	0.2142
Z	0.164025	1.188145	0.138051	0.8909
R-squared	0.040711	Mean dependent var	2.967073	
Adjusted R-squared	-0.009778	S.D. dependent var	3.603106	
S.E. of regression	3.620679	Akaike info criterion	5.481556	
Sum squared resid	498.1540	Schwarz criterion	5.606939	
Log likelihood	-109.3719	Hannan-Quinn criter.	5.527213	
F-statistic	0.806328	Durbin-Watson stat	1.869303	
Prob(F-statistic)	0.453987			

Results and discussions

The purpose of this paper is to study the relationship between inflation and the rate of economic growth. The first issue was the effect that inflation has on economic growth. Second, the causal relationship between them was assessed.

The study of the data obtained from the Bank of Albania and INSTAT was processed using the econometric model. By means of various statistical tests, the importance of the model and the determining factors was proved. It was estimated that:

- The increase in inflation has a negative and significant impact on economic growth, namely, an increase of 1% reduces economic growth by 0.6%.
- Using the Granger Causality test, it was found that inflation has an impact on economic growth, but the opposite is not proven.

Partially, the results of this paper are in line with the studied literature. During the review of the literature, the studies concluded in three directions; as a negative relationship between two variables, positive and neutral. This is explained by the different economic structures and policies of different countries.

During 2022, inflation is increasing and has reached the highest level of the last two decades in Albania. The study of this effect contributes to the various policies undertaken by policy makers where the effect is clear in value and impact. On the other hand, the importance of the model and the effect it shows us, evaluates both the cause-and-effect relationships and the influencing factors in them.

From the results of the paper, we conclude the negative effect of inflation on economic growth. For this reason, keeping inflation at a stable level should be the main goal of the Bank of Albania and the monetary policies followed. In this context, the containment of inflation growth and the beginning of its downward trend will also be influenced by the Bank of Albania's decision-making through monetary policy instruments aimed at controlling the money supply and therefore reducing aggregate demand.

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The theories of exchange rates and the factors that influence real exchange rates in a country

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Abstract

In a country with an open economy, the exchange rate is a critical variable in terms of its interaction with other internal and external economic variables. The focus remains relatively high on the role of the exchange rate in the country's economic factors. Usually, in countries with developing economies, such as Albania and Western Balkan countries, many transactions in foreign currencies are carried out in a more free market than through official channels. In this paper, we will deal theoretically with some critical issues related to the exchange rate regime that a country follows, starting from a historical overview of exchange rates theories, the Purchasing Power Parity theory, and the main determinants of the real exchange rate.

Keywords: Real exchange rate, PPP theory, trade balance, the balance of payment

JEL classification: E010, F630, O110.

Introduction

1.1 Price and Exchange Rate Volatility

The purchasing power parity (PPP) hypothesis is one of the oldest theories of exchange rate determination, which depicts the relationship between exchange rates and prices. In its 'absolute version,' the hypothesis states that the exchange rate (the domestic currency cost of a unit of foreign currency) equals the domestic-to-foreign price ratio. Manzur (1990) was one of the first to present evidence that PPP is a long-run phenomenon. He was also among the first to measure the long run: his findings identified five years as a broad measure of the length of the long run in terms of PPP. The literature now agrees that PPP is a long-run phenomenon, but the issue of the speed of convergence toward long-run PPP is puzzling.

Gustav Cassel, a Swedish economist, developed the concept of PPP in the 1920s to investigate the relationship between different countries exchange rates (Ersan, 2008). Purchasing Power Parity is a theory of international finance that attempts to quantify the relationship between inflation and exchange rates (Madura, 2016). The law of one price is the most stringent version of PPP, which states that after converting prices to a single common currency, any good should have the same price across countries (Findreng, 2014). According to (Muscatelli and Spinelli, 1999), purchasing

power parity (PPP) and determining long-run real exchange rates are theories that have received more scrutiny than others.

1.1.2 Relative Purchasing Power Parity

According to Edwards (1998), the modern concept determines exchange rates through the relative price of traded goods to non-tradable goods. According to the above study, the relative theory of PPP occurs when the change in the exchange rate over a period equals the change in inflation rates between countries over the same period. The APPP concept states that the exchange rate between two countries will equal the ratio of their price levels. Absolute and relative PPP account for exchange rates; however, relative PPP serves as the foundation for the IFE. According to the PPP theory, the difference in inflation rates equals the expected changes in the spot rate. The purchasing power parity theory defines two equilibrium rate systems. The first is the short-run equilibrium exchange rate, defined as the rate that would exist if all exchange rates were freely floating. The second type of equilibrium is the long-run equilibrium, which would result in the balance of payment equilibrium over a while of cooperating and cyclical fluctuations in the balance of payments.

1.2 Interest rate and Exchange rate volatility

The international Fisher theory, interest rate parity theory, purchasing power parity theory, and Balance of Payments theory are all theories that explain this up-and-down movement in the exchange rate. According to real options theory, investment decisions are linked to the impact of macroeconomic uncertainty (Dixit et al. 1994). Thus, the volatility of the exchange rate as an indicator of uncertainty explains the behavior of investor decisions. Firms that decide to increase their investment will find stable exchange rates appealing. As a result, researchers employ the real options theory to investigate the relationship between exchange rate volatility and economic growth. These theories concern parity conditions, an economic explanation for the price at which two currencies are exchanged based on inflation and interest rates (Otuori, 2013; Madhura, 2008; Isard, 1995). These economic theories contend that arbitrage opportunities for market participants arise when parity conditions do not hold. According to Levi (2005), in the absence of restrictions such as shipping costs and tariffs, the price of a product in all countries is the same when converted into a common currency, such as the US dollar using the spot exchange rate law of one price.

Because of globalization, exchange and interest rate volatility has become even more pressing; countries interact with one another through trade and investment (Suranovic, 2012). Volatile exchange rates are associated with random movements in an economy's relative prices. As a result, a stable exchange rate is critical in stimulating total investment, price stability, and stable economic growth. Although some researchers disagree with the empirical findings of tight monetary policies, such as high-interest rates, in stabilizing exchange rates, most agree on a significant level of agreement (Chen, 2006). Perhaps support for this policy is based on the conventional wisdom that, during exchange rate fluctuations, rising interest rates make speculation against the domestic currency unappealing because raising domestic interest rates has the potential to attract foreign investment. Furthermore, it influences domestic investors' decisions to invest abroad, resulting in an inflow of foreign currency that can help to stabilize the exchange rate (Verbeek, 2004). The

International Fisher Effect theory is appealing because it focuses on the interest-exchange rate relationship. A relationship between interest rate and subsequent changes in the spot exchange rate appears to exist in the long run but with significant deviations in the short run (Hill, 1997). The international Fisher effect is a poor predictor of short-run fluctuations in spot exchange rates (Cumby & Obstfeld, 1981). Thomas (1985) tested the IFE theory by examining the results of buying future contracts with higher interest rates that contained discounts (relative to the spot rate) and selling future contracts with lower interest rates that contained premiums. The study found that, contrary to the IFE theory, 57 percent of the transactions generated by this strategy were profitable. If the IFE theory is correct, high-interest-rate currencies should depreciate while low-interest-rate currencies should appreciate, resulting in negligible profits from the transactions. Following loan repayment at the end of the investment period, it was discovered that the spread (difference between the return on investment and cost of borrowing) was usually positive.

1.2.1 International Fisher Effect Theory

The famous Fisher hypothesis serves as a starting point in the quest to comprehend the relationship between nominal interest rates and Inflation (Nemushungwa, 2016). The Fisher effect is based on the assumption that potential savers in a country expect a return on their local savings and will only be willing to save money if their savings grow faster than the prices of the products they may buy (Madura, 2016). The Fisher effect and PPP theories are the foundations of the IFE's evolution (Khawaga, Esam, & Hammam, 2014). According to Fisher (1930), a change in the inflation rate causes an equal change in the nominal interest rate so that monetary shocks have no long-run effect on the real interest rate. Countries with high-interest rates are expected to have higher inflation rates than those with low-interest rates.

1.3 Criticism of the theories

Below are some of the main criticisms of the Purchasing Power Parity Theory leveled by various authors, all based on scientific evidence. PPP is a theory that attempts to quantify the inflation-exchange rate ratio while allowing more accurate data comparisons between countries. The PPP theory is more important in its dual role than its first because the theory produces poor results in practice. For two reasons, purchasing power parity remains essential to open economy macroeconomics. It serves as a standard for assessing an exchange rate level for starters. Cassel (1918) argued that there would be no way to discuss overvaluation or undervaluation without PPP. This recognition has found a concrete expression in the real exchange rate series that governments, international organizations, and financial institutions now routinely calculate and report. This series depicts a country's exchange rate-adjusted price relations with its trading partners. The series is built on GDP deflators, unit labor costs, manufacturing, and wholesale prices for major industrialized and developing countries. Changes in real exchange rates unambiguously translate into changes in competitiveness, from which trade flows and net exports can be anticipated (Casel, 1918) and (Krugman, 1976). The second application of PPP is as an exchange rate prediction model. A monetary expansion would result in wages, prices, and the exchange rate under perfectly flexible wages and prices, leaving all real variables unchanged. Expansionary monetary policy is only effective when wages and prices are less than fully flexible, and its effectiveness increases as the exchange rate become more flexible. The macroeconomic theory focuses on information,

contracting, and pricing models to investigate the causes of PPP failure and determine the extent and persistence of policy effects (Dornbusch, 1976). Many authors, including Keynes, have criticized the Purchasing Power Theory (Keynes 1923). According to him, systematic approaches to relative price changes undermine the Purchasing Power Parity's strict validity. Current exchange rates frequently differ from calculated purchasing power parities, arguing against the purchasing power parity theory. The theory proposes a functional relationship between the two currencies' purchasing power and exchange rates. However, there is no such direct and precise link between the two. Tariffs, speculation, capital flows, other factors, and currency purchasing power significantly impact the exchange rate.

According to the literature, the Purchasing-Power Parity theory is not entirely correct. Exchange rates do not always move so that a currency (for example, the US dollar) has the same absolute value in all countries. There are two reasons why the purchasing-power-parity theory does not always hold in practice. The first reason is that many goods are difficult to trade. The second reason purchasing-power-parity does not always hold is that tradable goods are not always perfect substitutes when produced in different countries. Real exchange rates fluctuate over time for these reasons. The purchasing power parity theory is a good starting point for understanding exchange rates. People have a greater incentive to move goods across national borders as the real exchange rate deviates from the predicted purchasing-power-parity level, even if purchasing-power-parity forces do not entirely fix the real exchange rate.

The traditional view of exchange rate fluctuations emphasizes that the devaluation of the national currency positively affects economic development. According to Salvatore (2005), the devaluation of a currency will cause local goods to be less expensive abroad, increasing their demand and exports. The case of depreciation is that after a country depreciates its currency, it enhances its exports' value competitiveness, a component of gross domestic product. The traditional approach mentioned above for exchange rate fluctuations impacts a country's economic growth through two main channels: the Total Factor Productivity growth channel and the Capital accumulation channel. An analysis of these two directions follows below.

The disadvantage of the inflation targeting strategy is that it frequently emphasizes central banks' excessive rigidity and unspecified discretionary powers. In contrast, the specific problem can be lower economic growth rates and higher turnover volatilities due to a shift towards the restrictive or expansive effect of monetary policy - depending on the short-term deviation of current indicators of inflationary pressure above or below the target level. This issue is only partially resolved (Ivanov, 2012):

- The practice of explicit inflation targeting that does not support the zero-inflation rate;
- The practice of explicit inflation targeting that defines the allowed volatility range, for example, +/- 1 percentage point of the target inflation rate (e.g., Bank of England practice);
- The practice of informal inflation targeting in which price stability and numerically defined inflation rates relate exclusively in the medium and long term, but not in the short term (for example, the Bank of England practice);

The monetary policy effects on the economy are transmitted by impacting two different target groups (Central Bank of Albania, 2015). Primarily because of the response of financial markets due to the implementation of monetary policy instruments. Secondly, because of the response of households and businesses due to interest rates and liquidity conditions in the financial markets. In addition, the monetary policy is guided by forecasting the expected inflation rate. In practice, the Central banks set up a framework of analysis and forecasting that enables the timely identification of the deviations of inflation from the target and affects monetary policy decision-making accordingly (Mancheva, 2016). Therefore, monetary policy must be flexible enough to react quickly to the resulting disturbances. The economic policy becomes more complicated in an economic crisis, reduced production and employment, and high external debt. Monetary policy must not be so restrictive as to prevent revival and economic growth, nor must it be so expansive that it undermines its stability. The goal of all policies is development, and monetary policy must ensure the macroeconomic atmosphere that encourages the development of entrepreneurship as it is the basis of any economic development.

1.4 Types of exchange rates and Inflation

There are two types of exchange rate systems, fixed and floating exchange rates.

In a fixed exchange rate system, the Central Bank announces a certain value for the exchange rate and to keep the rate at this level it sells and buys the local currency. In a fixed exchange rate system, the monetary policy of this country aims to maintain the exchange rate at the announced level. Some of the arguments in favor of a fixed exchange rate are:

Fixed exchange rate produces low inflation and increases credibility.

They are a path for economic growth.

Produce fiscal discipline.

The fixed exchange rate lowers the cost of access to international financial markets, lowers interest rates, facilitates disinflation and makes it more difficult to monetize the fiscal deficit.

This exchange rate can promote international trade and investment by eliminating exchange rate risk (Moosa, I. A., 2004).

Some of the most ardent defenders of fixed exchange rates point to the fact that exchange rate uncertainty makes international trade difficult. Some economists attribute exchange rate volatility to irrational speculation by international investors. This exchange rate volatility can be harmful because it increases international business transactions' uncertainty.

In a floating exchange rate system, the exchange rate is determined by the market, through supply and demand, and is allowed to move in response to economic changes. In this system, the exchange rate is adjusted to reach the balance between the market of goods and services and the monetary one (Mankiw, 2010). Since floating exchange rates allow for automatic adjustment, they cushion the domestic economy from external changes in international supply and demand.

A floating exchange rate can also be an automatic solution for adjusting the domestic economy. If the economy grows too fast, the exchange rate is likely to appreciate, which helps slow aggregate spending by slowing export growth. Although this is not positive for exporters, it can generally be a good alternative to "higher inflation" or "a sharp contraction in fiscal or monetary policy" to avoid inflationary pressures. If the economy is in recession with declining incomes, the exchange rate will likely depreciate, which will help overall growth through increased exports, even in the absence of domestic recovery (Labonte M., 2004). Exchange rate drift refers to the deviation of the real exchange rate from its long-run equilibrium value. There are several methods to determine the long-run equilibrium value, the most commonly used being the purchasing power parity (PPP) method. Another way to study displacement is by measuring the current nominal exchange rate deviation from the PPP rate. These exchange rate shifts distort the comparative advantage pattern, which has negative consequences for the international market (Moosa, 2004).

The advantages of the floating exchange rate are (Moosa, 2004):

First, a floating exchange rate allows the country to have an independent monetary policy, unlike a fixed exchange rate regime where monetary policy is bound to maintain the official exchange rate.

Second, an advantage of the floating exchange rate is its insulating property concerning real shocks.

Thirdly, this regime offers the country stability compared to the fixed exchange rate system, such as Bretton Woods. Due to the lack of an effective regulation mechanism, fixed rate systems are thought to be prone to speculative attacks and periodic crises (MacDonald, 2007).

Fourth, it allows the central bank to retain two potentially important advantages over an independent central bank, the currency-issuing profit and the lender of last resort. The latter can be important in banking crises where the central bank's ability to create unlimited funds can be important in rescuing banks.

The growth of the world economy is slowing down, while inflationary pressures remain high. The war in Ukraine and ongoing problems in global production and trade chains – shocks that raise costs and hold back production – have translated into high inflation and the synchronized slowdown of all developed and developing countries. High inflationary pressures have forced central banks to aggressively raise key interest rates, bringing about a general tightening of financial conditions worldwide.

1.4 Conclusion

Studying the inflation we can see that its level directly impacts the exchange rate between two currencies. This impact is seen on several levels but mostly of purchasing power parity and interest rate.

Purchasing power parity compares countries' purchasing power based on their general price levels (not their exchange rates). This way, we can determine which country has the most expensive cost of living. The exchange rate is affected by changes in purchasing power parity (and therefore

inflation). The exchange rate will remain as long as inflation is the same in both countries. Exchange rates are affected by inflation if one country's is higher than another. When the inflation rate is higher, the currency loses value and depreciates, whereas when the inflation rate is lower, it appreciates.

As for the impact of interest rates, increasing interest rates can lead to currency depreciation (less remunerative) on Forex due to high inflation. In contrast, low inflation (or deflation) pushes interest rates down, which increases the currency's value on the Forex market. The effect of inflation is much more likely to be negative than positive. Exchange rates are likely to be negatively affected by high inflation, while low inflation does not guarantee an increase.

We must see carefully in other aspects beside inflation figure alone. Central banks are focusing in changes in the inflation rate. If inflation rates continue to grow, there is a risk of rising interest rates. On the other hand, there is a risk of falling interest rates if the inflation rates are downward. But central banks always relate the level of inflation to the country's economic growth rate. Changes in interest rates depend on monetary policy, but central banks often refuse to sacrifice economic growth, especially in times of crisis.

It is also to be noted that the inflation impact on the exchange rate is theoretical. There are many other factors that must be considered in determining the exchange rate.

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The impact of social media marketing in the consumer perception of recyclable packaging in the beauty industry

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Abstract

While environmental and climate issues have been on the rise as a result of the increasing growth of industries and economies around the globe, Circular Economy (CE) has emerged as a model of production, consumption and then reusing, remaking and recycling of materials or products for the longest time possible, thus avoiding pollution and waste. The role of Marketing in CE can be extended in two main directions: promoting the brands and products that implement this model and also educating the consumer on the importance and reasons for embracing it. So, it can help shape the consumer behavior, thus facilitating the transformation towards a circular economy.

Nowadays, digital marketing and more specifically, social media marketing, has shown a great effectiveness in terms of reach and influence on consumer choices and perceptions, making it strategically one of the best options to hinder this transformation.

This paper aims to shed light on the impact of social media marketing on consumer perception in Albania on the recyclable packaging implemented by the beauty industry, their level of consciousness about CE and whether it influences the beauty products and brands they prefer. A mixed methods research was conducted using online questionnaires, targeting female students of four main faculties of the University of Tirana, chosen due to the fact that they are generally heavy social media users and a main target group of the beauty companies. The conclusions following the data analysis suggest a gap in consciousness on CE but also great potential for embracing change.

Keywords: digital marketing, consumer perception, recyclable, beauty industry, packaging

Jel codes: M1, M3

(i) Introduction

The main pillars of the literature review in this article follow below:

Definition of beauty industry

Refilling and recycling packaging definitions and why it is nowadays a problem, challenge and necessity for the beauty industry

How is the industry reacting toward this problem? Focusing on refillable products and what are the benefits of adopting it.

Is offering refillable products enough for this strategy to be successful? Research data on the importance of communication.

Are there any statistics regarding cosmetics/ skincare products that have adopted this strategy?

The Tools and Methodology section provide all information on the research further conducted in the Albanian market with regards to the beauty industry and customer choices, followed by the conclusions and recommendations.

(ii) Literature Review

Switching from a linear model to a circular one is one of the main challenges of today's economy, and there are two main reasons behind it. Around the globe, water, air and land pollution is a very crucial issue, as the production alone of materials we use every day account for 45% of the CO2 emissions (European Parliament, 2022). Moreover, in the linear economy, after usage, these products/ materials end up as waste, and the part of them that is not biodegradable sticks around for way longer than the lifetime of its one-time consumer, being accumulated on land, at sea or just burned in landfills, causing even more CO2 emissions to say the least. The circular model, as a concept, offers a new approach to tackle the situation and minimize its' degrading effect on the planet. This model is based on the concepts of sharing, leasing, reuse, repair, refurbishment and recycling, in an (almost) closed loop, which aims to retain the highest utility and value of products, components and materials at all times (European Parliament, 2016). This way, the life cycle of products is extended, waste is reduced to a minimum (ideally) as well as greenhouse gas emissions. A Circular Economy Action Plan has been adopted within the European Union since 2020, aiming to integrate concrete measures on all levels, from legislation and policy changes to providing support and guidance to business sectors to monitoring the progress of the economy as a whole into this new model (European Commission, 2020).

The beauty industry includes a wide variety of products such as cosmetics, skincare, beauty appliances etc. and also services related to them. Traces of its existence have been found, dating thousands of years ago, but nowadays it is one of the most lucrative industries, and still expected to keep growing in the years to come. Globally, it faced a whopping decline of 15% in overall retail sales in 2020 (McKinsey & Company, 2021), but it has been able to not only bounce back to its previous levels but also surpass them by reaching a total revenue in beauty and personal care

products market of USD 528.60 bn in 2022; the expected annual growth rate of this market is 4.64% (Statista, 2022).

One of the main problems of this industry is especially related to the cosmetic and skincare products, as it involves their plastic packaging. Although there is a presence of alternative 100% recyclable elements such as metal and glass, used to provide packaging for these formulas, plastic materials are absolutely the most dominant version, also because they are the most practical for transportation and usage, accounting for the production of over 120 billion units of packaging globally every year, in the personal care and beauty industry alone (The Guardian, 2021). Of the 40 million tons of plastic waste generated in the U.S. in 2021, only 5% to 6% - or about two million tons - was recycled (World Economic Forum, 2022), a fact which indicates that the rest of the plastic waste is exactly left as that – waste, contributing to a further global pollution. Moreover, this packaging amounts for 40% of single-use plastics (SUPs), invented for the modern “throwaway society” and intended to be used only once¹⁴. Chances are, even if the plastic is theoretically recyclable, it is still going to end up in a landfill, because the more costly and complex the packaging, the harder it is to collect, separate and recycle. As a result, it makes it more economically viable to simply trash it than put forth the resources to recover it. (The Guardian, 2019). So, the two main approaches of the beauty industry, as alternative solutions that could help transition into a circular model are trying to switch to easier and practical packaging made out of biodegradable plastic or offer products that come with a refill option, as in that after the product is consumed, the buyer has the option to purchase a refill and place it inside the container already used the previously. This approach offers the benefit of using the packaging for longer and hopefully recycled, and, the refill version of the product would simply cost less for the buyer, cutting off from their expenses, which from a marketing perspective, would offer an advantage for the beauty companies as well with regards to these product launches.

More and more beauty companies are transitioning from single - use to reusable packaging, thus being able to reduce production costs, waste and greenhouse gas emissions (Avieco, 2022). The packaging itself is a very direct and visual way to communicate with the consumer, but this matter also needs prioritization and good communication in order start changing their behavior. It is not a fast process and it needs a cross-channel collaboration. Once the company has built an ecosystem that provides solutions for a refilling strategy and makes it tangible for the buyer, it needs to promote and communicate this innovation offline in selling points, where it will actually happen, as well as online through e-commerce sites and social media. One of the latest studies has shown that among other variables, social media marketing has a strong and positive association with the intention to purchase green products on social media.¹⁵ Moreover, it can effectively influence

¹⁴Chen, Y., Awasthi, A. K., Wei, F., Tan. Q & Li, J. (2020) *Single-use plastics: Production, usage, disposal, and adverse impacts*. Science Direct.

¹⁵Nekmahmud, M., Naz, F., Ramkissoon, H. & Ferkete – Farkas, M. (2022) *Transforming consumers' intention to purchase green products: Role of social media*. ELSEVIER

consumer behavior towards plastic consumption if the information presented are from confirmed studies that can easily translate to results based on their own action and has a direct impact on their health.¹⁶ So, social media marketing can potentially be a key factor in helping make the shift in terms of consumer awareness of the issue and also purchase intention.

Many beauty companies have launched cosmetic products but also skincare products with refillable packaging, with lipsticks and moisturizers being two of the main examples. New brands such as Fenty Beauty and Fenty Skin, part of the same company, have launched the Fenty Icon refillable lipstick as of 2022 and an entire line of refillable skincare products, accessible both online and in-store.¹⁷ Every launch has been carefully communicated on the website and all social media platforms, especially in the company's Instagram and YouTube official accounts. The innovations regarding the packaging are communicated in a very simple but detailed way through images and videos.

Dior, a well-known luxury brand in fashion and now beauty industry, in January 2021 launched a new line of refillable lipsticks in 75 shades. The launch was also reflected on social media, although not as much as on traditional channels, represented by tv ads featuring famous brand images (example: actress Natalie Portman)¹⁸, a much more common strategy for the company. The focus was more on the attributes of the formula than on the innovative packaging.

Chanel, another famous luxury French brand, has decided to approach sustainability through refillable perfume bottles or so called "purse spray" given their volume of 60 ml, as of January 2022¹⁹, followed by a range of products, called No. 1 de Chanel, which is housed in packaging with no outer plastic wrapping and no inner paper leaflets.²⁰

(iii) Tools and Methodology

The main goal of this article is to shed light on the impact of social media marketing on the perception of the Albanian consumers on the reusable (refillable) packaging implemented by the beauty industry, more specifically female students aged 18-24 years old, from four main faculties

¹⁶ Rapada, Maria & Yu, Derrick & Yu, Krista. (2021). Do Social Media Posts Influence Consumption Behavior towards Plastic Pollution? Sustainability. 13. 12334. 10.3390/su132212334.

¹⁷ <https://fentybeauty.com>

¹⁸ https://www.dior.com/en_int/beauty/make-up/rouge-dior-the-new-couture-lipstick

¹⁹ <https://www.chanel.com/al/fragrance/p/125450/n5-eau-de-parfum-refillable-spray/>

²⁰ Hutchins, R. (2022). Chanel launches 'most environmentally conscious' collection to date going refillable and plastic-free. Products of Change. <https://www.productsofchange.com/news-article/chanel-launches-most-environmentally-conscious-collection-to-date-going-refillable-and-plastic-free/>

of the University of Tirana: Faculty of Economy, Faculty of Foreign Languages, Faculty of Law, Faculty of Social Sciences.

Within this research, three objectives arise:

Finding out whether there is a level of consciousness about the recyclability of plastic packaging and its' importance.

Finding out whether social media is an important source of information and influence on the beauty products and brands they prefer.

Finding out whether packaging recyclability is an important factor in their buyer decision towards beauty products.

A mixed methods research (qualitative and quantitative) was conducted using online questionnaires, targeting female students.

This segment was chosen due to the fact that they are generally heavy social media users and a main target group of the beauty companies.

The questionnaire was conducted via Google Forms and a total of 114 valid forms was collected, spread among each faculty as below:

Table 1: Number of filled questionnaires collected from each faculty.

Faculty of Economy	54
Faculty of Foreign Languages	17
Faculty of Law	30
Faculty of Social Sciences	13
Total	114

The questions included in the Google Form have been listed below with their respective data which was collected:

Have you ever heard of recycling of plastic materials/ packaging?

Graph 1: Number of students not/aware of the recycling of plastic

Yes	106 (93%)
No	8 (7%)
Total	114 (100%)



The vast majority of the students (93%) were familiar with the concept of recyclability.

How much importance do you place in the recyclability of the plastic packaging in the products you consume?

Table 2: Number of students for each level of importance placed on packaging recyclability

Zero	19 (17%)
A Little	54 (47%)
Moderate	39 (34%)
A Lot	2 (2%)
Total	114 (100%)

47% of the students gave little importance to the recyclability factor when deciding to consume a product, 34% of them valued it moderately and only 2% placed a lot of importance on this factor, indicating that it is not the main driver of their consumer decisions.

Are you a social media user?

Graph 2: Number of students who are social media users.

Yes	114 (100%)
No	0 (0%)
Total	114 (100%)



Does social media influence you regarding the beauty products you choose to buy?

Table 3: Number of students not/ influenced by social media when buying

Yes	78 (68%)
No	36 (32%)
Total	114 (100%)

A considerable majority of them admit to being influenced by social media in their buyer decisions.

Have you ever heard of refillable cosmetic/ skincare products?

Table 4: Number of students not/aware of refillable beauty products

Yes	78 (68%)
No	36 (32%)
Total	114 (100%)

If so, where? _____

From 78 (68%) of the students that were familiar with refillable products in the beauty industry, 52 of them were informed via social media channels and the remaining 26 from the official websites of the respective brands and their newsletters sent through email subscriptions. So, those who engage, are likely to get informed regularly from the official sources of information.

Is refillability a factor that influences your decision when buying beauty products?

Table 3: Number of students not/ influenced by packaging refillability as a factor when buying beauty products

Yes	20 (18%)
No	94 (82%)
Total	114 (100%)

Despite the fact that the majority of the students are informed on the brands' approach towards recycling/ refillable product packaging, the vast majority of the students don't seem to find this an influencing factor when choosing their beauty products.

If not, what is the most influential factor when it comes to buying beauty products?

The 82% of the students that answered negatively to the previous question, gave these two factors as main reasons behind their decisions when it comes to beauty products:

62 of them made decisions driven by budget

13 made decisions driven by influencers/ famous people who promoted the brands/ products on social media

The remaining 9 had other factors such as the aesthetics and practicality of the packaging and accessibility of the products.

(iv) Conclusions and Recommendations

There is a general level of awareness among young female students regarding the concepts of recyclability, reusability and refillability in beauty products.

The students who were part of the sample were all social media users, which indicates a high level of engagement online. They tend to absorb information from social media regarding beauty products but nevertheless, don't generally place much importance on refillability when it comes to making decisions on which product to buy. This is partially due to the fact that mostly these decisions are budget driven; a minor part is influenced by other elements such as the beauty of the packaging or even the accessibility of these products. Many international beauty brands don't have official flagship stores in Albania, and are purchased either abroad or through alternative non official channels, such as other retail websites or points of sale in this market.

However, in the case of refillable products, if they are available in official points of sale, or better explained by beauty representatives at such stores, in the case of Albania this might be a limitation to the consumer choices.

An important recommendation would be to always have a synergy between offline and online presence in a market. Even when a consumer is well informed, it is not necessarily enough to drive them into a certain choice or decision when buying, because sometimes the lack of accessibility of the product makes it much harder to initiate a wave of change or transition into a different approach, such as that of recyclability, or in general terms, circular economy. Moreover, the consumer needs to perceive a sort of economic advantage when it comes to refillable packaging, but the shipping prices in online purchases combined with high custom duties in Albania, make lower prices for refills make almost no difference for consumers who are budget driven in their decisions.

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Labor market effects of circular economy policies

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One of the key objectives in almost every economy is the transition towards a circular economy. The labor market will be impacted by the implementation of greener policies. While the overall economy and labor market are expected to benefit in the long run, the short run impact is still ambiguous.

In this article, are being addressed the challenges that the labor market may encounter as this shift progresses, including the potential effects on net employment, skills requirements, job reallocation, etc. According to the literature review on the consequences of the circular economy policies, the change is likely to result in a minor net improvement in employment rates. However, these findings should be further explored in terms of duration, quality and gender aspects, emphasizing also the potential distributional consequences of these changes.

The circular economy is still in its early stages in Albania, being focused solely on waste management. There is a pressing need for improvement in two key areas: in the current legal framework and stakeholders awareness and knowledge.

Keywords: labor market, circular economy; employment

Jel code: J23; J24; Q01

1. Introduction

Climate crises and scares resources have led leading economies to lean towards resource efficiency and circular economy policies aiming at decreasing environmental impacts. Developed countries, such as Finland, France, and The Netherlands, have implemented circular economy strategies and legislative frameworks (Thieriot, 2015).

While the economies are shifting to greener businesses and solutions, structural changes are happening in the labor market, from material-intensive to more labor-intensive activities. The effect of such a change is still unclear. The projected net employment increase by European Commission (2018) is about 700,000 jobs in Europe and between 7 and 8 million worldwide by 2030.

According to a sectoral economic report of OECD (2012), four industries with high material demands account for about 90% of all worldwide material consumption. These industries employ only 15% of the labor force. This statistic is an indicator that job losses due to restrictive policies

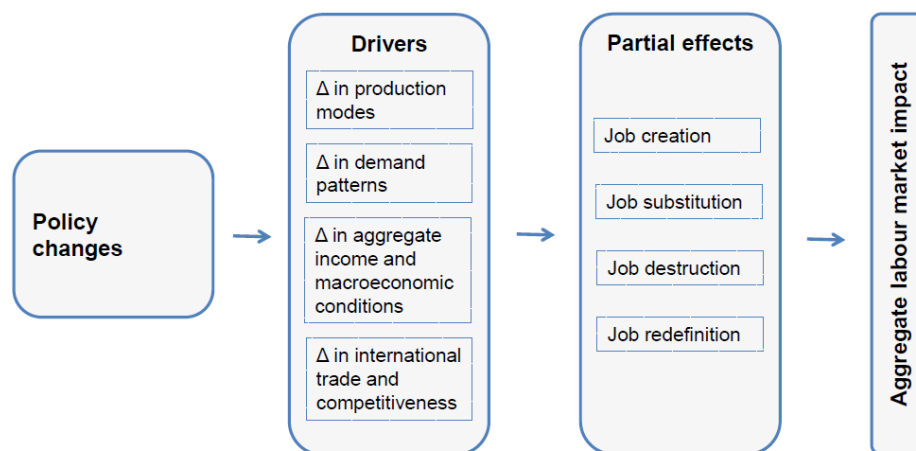
on material- intensive sectors might not be very significant, while they can be compensated by job creation in labor-intensive sectors.

The major shift of industries towards circular economy and greener policies will impact not only the number of jobs available, but also will cause changes in terms of in terms of duration, quality and gender aspects, emphasizing also the potential distributional consequences. These changes have to be further explored.

2. Potential employment impacts of circular economy policies

The implementation of policies in the direction of supporting the circular and sustainable economy will definitely have their effects on the labor market. According to an OECD analysis (2020), policy changes would affect four main directions: a) change in production modes; b) changes in demand patterns; c) changes in aggregate income and macroeconomic conditions and d) changes in international trade and competitiveness (Figure 1).

Figure 4: *Flowchart of policy induced changes in labor markets*



Source: OECD (2020)

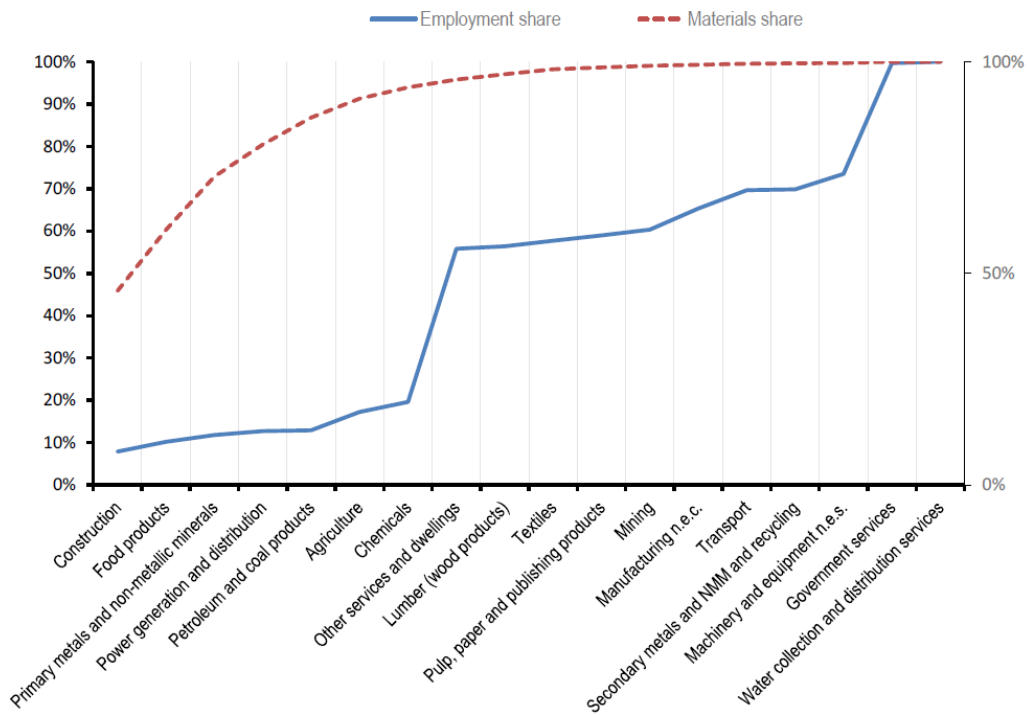
These changes will be the main drivers of the biggest changes in the labor market. The increased focus on circular economy policies, as well as the continuous incentives to reduce environmentally damaging activities, will exert pressure for major changes in production processes and the economy as a whole. Structural changes in the economy will create new jobs, or the change of existing ones, but will also cause the replacement of some jobs and even the disappearance of some of them.

These changes will affect not only the size of the labor market, but also the main indicators of this market. The creation of new positions will definitely give rise to the need for new professional

training, to enable the transfer of the workforce from one industry to a new one. Investment in circular strategies won't result in job possibilities without skill development. To keep up with new breakthroughs and technology, industries and employees must engage in continuous and lifetime learning. For this reason, it is expected that those who will be affected more quickly and severely are the older of the workforce and less the young, who find it easier to adapt. Programs for skill development should specifically target underprivileged populations such as older employees, employees in rural regions, women.

Also, the development of circular economy policies will not affect all sectors equally. The material-intensive sectors are expected to have greater pressure for change, compared to the labor-intensive sectors.

Figure 5: Cumulative shares of materials use and employment per sector in 2011



Source: OECD (2020)

The graph above represents the cumulative shares of materials use and employment per sector. The individual sectors in the figure are sorted by materials use, showing the sectors with the highest materials footprint on the left and sectors with small materials footprint on the right. Based on the graph we can say that the more material-intensive sectors are construction, food products and in general primary productions sectors. Those are the sectors that are expected to have the highest change rate during the implementation of sustainable policies and these changes will be reflected in the labor market by job destruction or redefinition. But these sectors account for not more than 20% of the total workforce. This suggests that job distraction will have a modest impact on the total workforce.

The most labor-intensive sectors based on the graph are services and government services, while they appear to have a low material use on the production process. Also new jobs are expected to be created, especially on sectors such as recycle, reuse, which are considered as labor-intensive sectors.

According to research production in a circular economy is more labor-intensive than it is in a linear economy (Wijkman & Skånberg, 2016). Shifting towards a circular economy will have a positive impact on the labor market in terms of the number of employees. What is unclear and needs further research, is the different impact in terms of geographic, distributional, gender and age dimensions.

Chateau, Bibas and Lanzi (2018) found significant differences in labor market implications of climate and energy policies depending on regional characteristics. Differences on country level in terms of economic development, technological development, specialization on material-intensive sectors, will result in different effects of green policies in labor market. So, countries that rely heavily on material-intensive sectors will have the highest impact, resulting in more job destruction or job redefinition.

But while it is believed that the sectors with low material use will not be affected much by the CE Policies, we must keep in mind that automation may bring a decrease in employment in these sectors. Also, the creation of some new jobs may be temporary. One of the sectors that is developing in the framework of sustainable development is that of waste management, thus creating new jobs in this sector. But in the long term, good waste management means a reduction in waste, which could mean the loss of some jobs in this sector.

As mentioned above, whenever structural changes occur in the economy, the older are affected more due to the lower flexibility in adapting to the new conditions. So, while the changes may be accompanied by the creation of new jobs, they may be inaccessible to the older employees, thus mainly benefiting the young, while the result for the elderly may be negative.

Also, we cannot ignore the gender element in this analysis. Waste management and services are expected to see the biggest initial job gains, while construction and non-metallic mineral extractive industries will experience the highest initial job losses. The percentage of women employed in the service sector is higher than the percentage of men in this sector. Sectors with low emissions, like the service industry, are typically correlated with increases in female labor participation and labor share. Men are overrepresented mainly in the primary production sectors, which are expected to be more affected by the implementation of green policies.

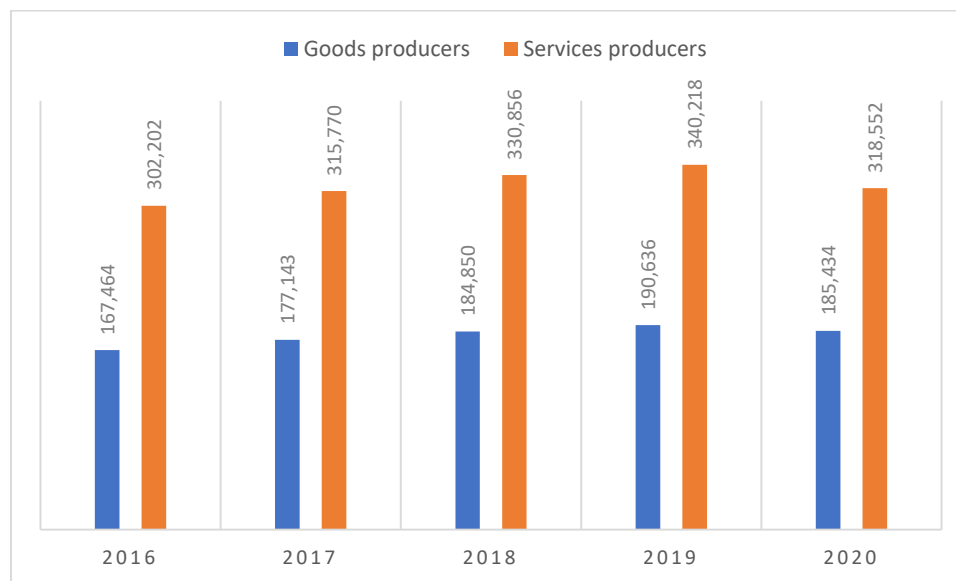
3. Potential employment impacts of circular economy policies in Albania

In Albania, the circular economy is still in its initial stages, being mainly focused on waste management approved in 2018 by the Waste Management Strategy 2018-2023. The draft Strategy considers the significance of waste management in accordance with the present economic model to enable the maximum conservation of natural resources and improve the effectiveness of product usage.

According to the report of the Institute of Habitat Development (2018), the current legal framework, including national regulations and national strategic documents and action plans, does not provide the basis for implementing the concept of the circular economy in the country. In order to boost the country's capacity to utilize its resources and the lifecycle of materials, products, and services more effectively, modifications to the current legal framework are urgently required.

Another problem that is evident in Albania regarding the circular economy and its development is related to the low level of knowledge and awareness regarding its importance in an economy. In recent years in Albania, there have been several initiatives from the private sector for orientation towards a circular economy. Meanwhile, governmental policies are focused on promoting and transitioning from a linear economy to a circular one. Undoubtedly, these changes, in the long term, will bring changes in the labor market.

Figure 6: Number of employed in Albania on good and service producers

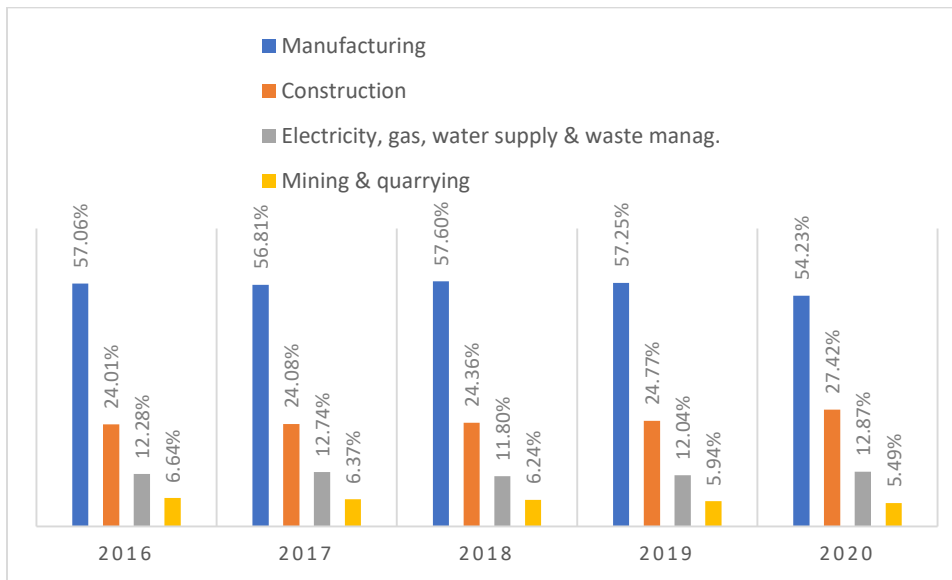


Source: INSTAT, 2022

In figure 3 is shown the number of employees in material-intensive sectors (goods production) and in labor-intensive sector (service production), throughout 2016 -2020. The largest number of employees turns out to be in the services market, even though there is a larger number of companies that are active in the goods production sector. We also see that the number of employees in both

sectors has increased, but the service sector continues to employ more people than the goods production sector. The higher concentration of employees in the services market, compared to that of goods, shows that the effect of the implementation of circular economy policies in the long run might have a positive effect in the number of employees.

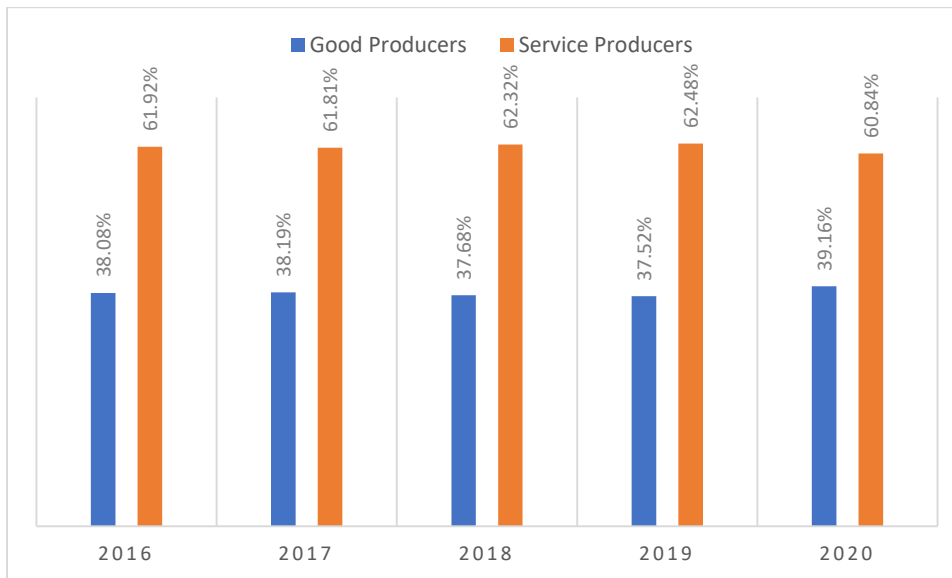
Figure 7: Percentage of employed in industries on good production sector



Source: INSTAT, 2022

Most of the employed, over 50% of them, are employed in the manufacturing industry, and only in the last year has there been a decline. From the graph, we can say that this decrease in the percentage of employment in the manufacturing industry is a consequence of the relocation of workers to the waste management industry. This is a good indicator, which speaks of an expansion, albeit modest, of this industry.

Figure 8: Percentage of women employed on good and service producers



Source: INSAT, 2022, Author's calculations

Even in the Albanian market, the same trend is evident, the majority of women are employed in the service sector, while the opposite happens with men who are mainly concentrated in the production sector. Consequently, the expectations for the Albanian labor market are that with the intensification of circular economy policies, those who will be affected the most will be men.

The effects of circular economy policies implementation, therefore, will not cause changes only in the labor market, but they will undoubtedly affect important socio-economic aspects too. As mentioned in our analysis, the effect will extend in several directions: such as the change in employment rates among different groups, the emergence of the need for new training and knowledge, inequality in distribution, etc. That's why ILO (2018) suggests four policy areas to link social protection and environmental sustainability: protection against unemployment, cash transfer programs, public employment programs, and compensation for ecological services. It is crucial that policymakers develop a knowledge of which jobs contribute to a circular economy and what skill set is required to fulfill these tasks across various industries and areas in order to further promote a move toward circular jobs.

4. Conclusions

The labor market is undergoing structural changes as economies transition to greener enterprises and solutions. The implementation of these policies will result in structural changes to the economy, which will then be reflected in the labor market in the form of new employment being created, current jobs being changed, some jobs being replaced, and even some jobs being eliminated.

The sectors that are expected to see the greatest rate of change throughout the implementation of sustainable policies include construction, food production, and generally primary production. These changes will be reflected in the labor market by employment loss or redefinition. Additionally, it is anticipated that new opportunities would be created, especially in labor-intensive industries like recycling and reuse. The impact will be greatest in nations with a high reliance on material-intensive industries, which will lead to more employment loss or job redefinition. The introduction of green measures is anticipated to have a greater impact on men.

The circular economy is still in its early stages in Albania. It is urgently necessary to change the current legal system and raise awareness in order to increase the potential of the country. The services sector ends up having the most employees. The number of employees may increase as a result of the adoption of circular economic strategies in the long run. It is expected that in Albanian labor market, men and older workers would be the ones most impacted by the expansion of circular economy policies.

Public employment initiatives, professional training, and regulations protecting against unemployment will undoubtedly arise with the implementation of CE policies and the creation of new positions. To further encourage a shift toward circular jobs, policymakers must understand which jobs contribute to a circular economy and what skills are necessary to carry out these duties across diverse industries and areas.

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Circular Economy and Business Model: A Systematic Literature Review

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Abstract

Circular economy is a topic that has been discussed a lot recently as a new economic model that is friendly to the environment and compatible with limited natural resources. To go towards a circular economy, companies must be aware of its benefits and engage in sustainable practices by rethinking their business models. This study investigates how circular economy and business models are related to the current business and management literature. Based on a systematic literature review and bibliometric analytical procedures, 189 articles were retrieved from the Scopus database. VOSviewer is used to explore the most researched terms and their relationships, the most cited authors and links between citations, and to identify the least explored terms and research gaps. The literature analysis shows that the concepts of the circular economy and the business model have vital relationships with the terms: sustainability models, supply chain, business model innovation, recycling, environmental impact, waste management, etc. This study contributes to the enrichment of knowledge about the circular economy and business models in two ways: First, it brings a general theoretical framework where the study of concepts is focused and an emerging approach. Second, it identifies the needs and gaps for further studies.

Keywords: Circular economy, business model, bibliometric, literature review, research gap

Jel Code: M21, M14, M0

Introduction

The global economy is facing a challenge that requires immediate measures. The global population is increasing every day, and meanwhile resources are running out. The circular economy is now, more than ever, perceived as a critical approach and many governments are adopting circular strategies as part of their environmental action plans. On the other hand, even businesses that, until

now have been oriented by market demand and consumer behavior are facing an increase in resource prices and must think about sustainability in their business models.

Boulding (1966), who first mentioned the closed economic system, called the linear economy comparatively the "cowboy economy," associating it with reckless, exploitative, and violent behavior. On the other hand, he symbolically called the closed economy the economy of a "spaceman" in which the earth is like a spaceship with limited resources and in need of energy to move forward (Kenneth E. Boulding, 1966)

Furthermore, circular economy has been studied by different disciplines, and it has undoubtedly become the focus of studies in the field of management that are aware of the effects that the external business environment has on the entirety of management functions and the adaptation of best practices. The transition to a circular economy requires adapting practices and business models and creating new ones (Bocken et al., 2016).

A circular economy should not be seen only as a model for environmental protection. The results targeted by this model are broader and do not conflict with the well-known objective of profit maximization. The circular economy model can provide a competitive advantage for businesses (Ellen MacArthur Foundation, 2013).

At the macro level circular economy, through more efficient use and reuse of resources, reduces the amount of waste and negative impacts on the environment without jeopardizing economic growth and prosperity. This model can bring a better balance between the economy, environment, and society (Geissdoerfer et al., 2018).

At the business level, the principles of the circular economy affect how we make money and the ownership structure and drive the shift from a product-focused industry to a service industry (Ferasso et al., 2020).

This study aims to answer these research questions: What is the current situation of circular economy research and business literature? Where is the research field of circular economy business models oriented? And what are emerging issues about the circular economy business model?

A bibliographic analysis of 189 articles published in Scopus about the circular economy and business models until October 19, 2022, was made to address these research questions.

This study contributes to creating a more complete picture of where the discussion of circulating business models is focused, which are the most current topics, and the localization of new issues with potential for the future.

Literature review

Although the circular economy is a relative notion, it has received considerable attention in the literature in the last few years. The idea of the circular economy has been approached in the scientific literature from several interdisciplinary perspectives, including industrial ecology, product design practices, environmental, political, and social science fields (Ferasso et al., 2020). Of course, this is also reflected in numerous definitions by different authors. Being a multidisciplinary field, the circular economy is conceptualized in various ways, leading to a problematic conceptualization of its concept (Gladek, 2017).

Initially, the Circular Economy field was mainly investigated from a technical perspective, examining the efficient use of resources, the generation of waste, and their impacts on the environment. However, recently, researchers have recognized that to facilitate the implementation of the Circular Economy, fundamental transitions in business establishment strategies, value chains, and business models are necessary (Rosa et al., 2019).

There are several authors who have analyzed the definition of the circular economy. Kirchherr et al. (2017), after analyzing 114 different definitions of the circular economy, defined in this way the concept: *“A circular economy describes an economic system that is based on business models which replace the ‘end-of-life’ concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations”* (Kirchherr et al., 2017, p.226).

One of the most cited definitions is that of the Ellen MacArthur Foundation (2013), which describes the Circular Economy as: *“an industrial system that is restorative or regenerative by intention and design. It replaces the end-of-life concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse and return to the biosphere, and aims for the elimination of waste through the superior design of materials, products, and systems and business models”* (Ellen MacArthur Foundation, 2013,p.7).

In the context of the circular economy, the business model concept provides a framework for understanding how companies propose, create, and capture value while applying the principles and practices of the circular economy (Ferasso et al., 2020). A circular business model is designed to create and capture value while helping achieve an ideal resource usage state. Accordingly, the goal of the business model shifts from making profits through the sale of products to making profits through the flow of resources, materials, and outcomes over time, including reusing goods and recycling resources (Lahti et al., 2018). According to MacArthur Foundation, some “key elements” are very important for the circular economy, including: Designing the future, rethinking the business model, incorporating digital technology, collaborating for joint value creation, and strengthening and advancing knowledge (Ellen Mac Arthur Foundation, 2021).

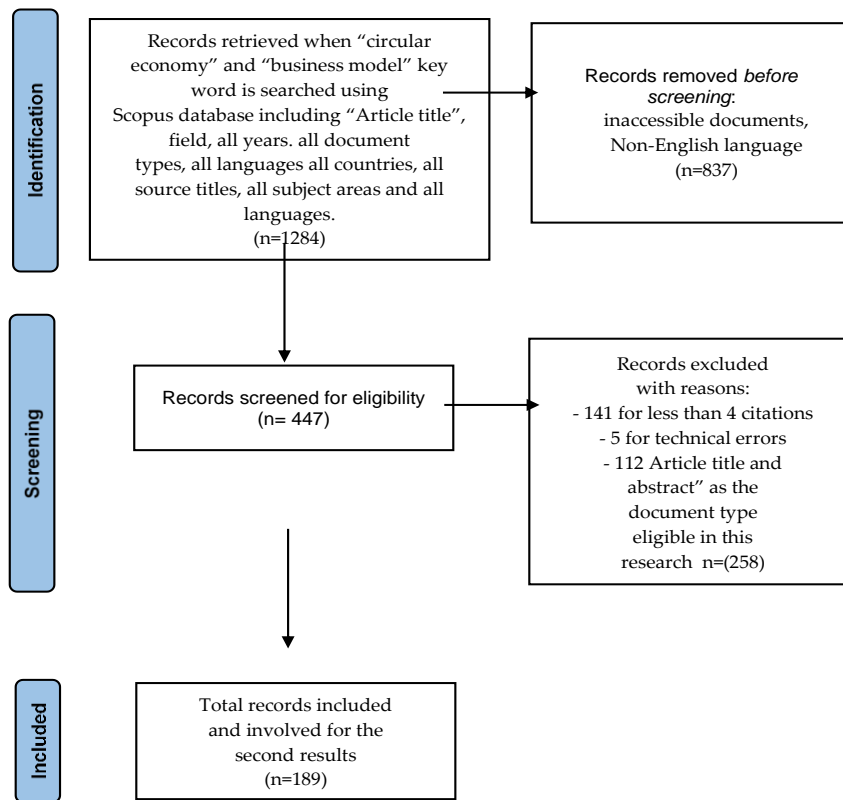
The latest research connects the circular economy with some areas of management, such as supply chain management, innovation, or marketing. The need for a more unified understanding also shows us unexplored areas for future research fields (Ferasso et al., 2020).

Tools and methodology

The literature review helps researchers to identify fields that need to be mapped and evaluated (Tranfield, 2003). A systematic literature review was selected as an appropriate approach to a detailed literature analysis to achieve the research purpose. To analyze the circular economy in terms of business models is applied the “Prisma” method. The Meta-Analysis (PRISMA), published in 2009, is designed for all systematic reviewers to report various studies and findings transparently. It is a method that helps identify, select and synthesize studies (Page et al., 2021).

In this paper, according to the Scopus database, there are two available access types: open access (OA) and others. In “others,” there are included: Gold, Hybrid, Bronze, and Green, which are not supported in Scopus (<https://www.scopus.com>). This study considered all open-access article. Initially, the search used the keywords "circular economy" and "business model." This resulted in 1284 documents. Then the search was limited only to the document type: article, publication stage: final, and English language. The number of articles after these limitations reached 447. From those, 141 articles with less than four citations and five articles for technical errors were excluded. In the last stage were reviewed the titles, abstracts, and keywords of the filtered items, double checking the selection criteria and deleting the papers that were not related with the field of circular economy and business models. A total of 189 items were included for further examinations. The PRISMA flow map illustrates the distribution of articles by year of publication (Figure 1). Articles were published from January 2013 to October 2022.

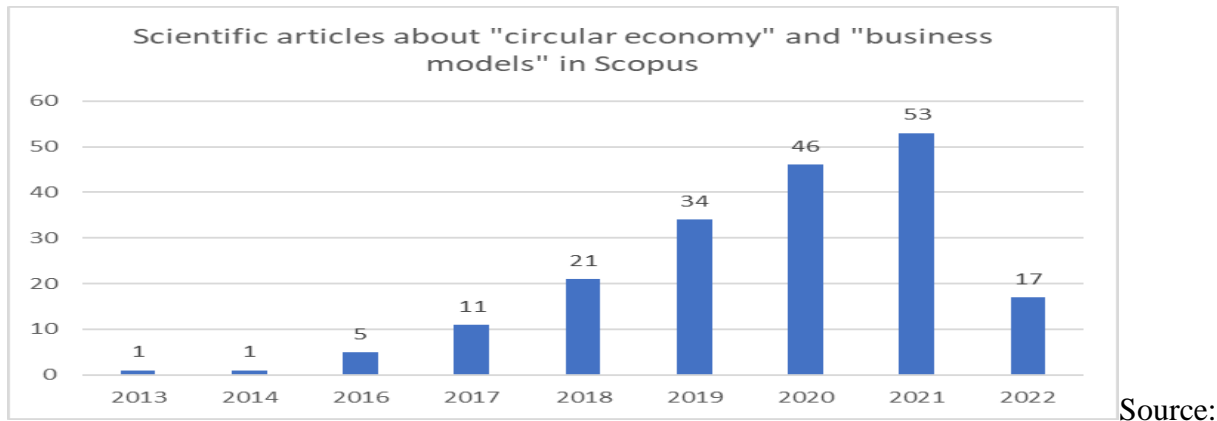
Figure 1: Prisma flow map (data in the Scopus databases on October 19, 2022)



Source: Page et al. 2020, processed by author

As a first finding, an exponential increase in publications can be noticed since 2017. This indicates the increased attention of researchers in this field of research, and it can be assumed that it will continue in the future. The latest global developments may further stimulate research efforts on this topic.

Figure 2: Scientific articles about "circular economy" AND "business models" in Scopus (n=189)



Scopus; data processed by the authors

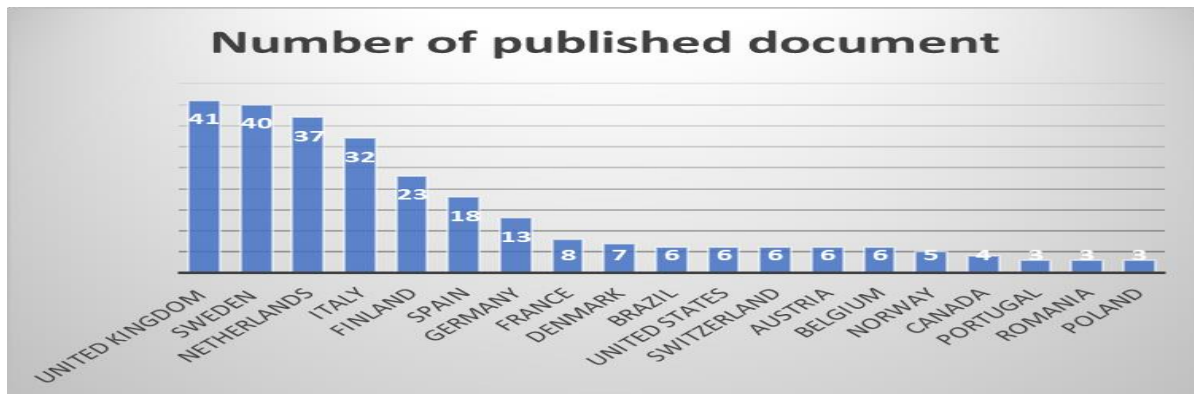
The distribution of papers across journals (Table 1) highlights the large variety of journals publishing articles at the intersection between circular economy and business models (56 different journals)

Some of the most popular journals have been identified based on the number of papers published. There are included Journal of Cleaner Production, Sustainability, Business Strategy and the Environment, Resources, Conservation and Recycling, and Sustainable Production and Consumption. Most of the magazines have only one published article about the circular economy and business models.

Table 1: Top five journals, as determined by their number of published articles.

Source	Documents	Citations
Sustainability	52	2263
Journal of Cleaner Production	34	2371
Business Strategy and the Environment	16	690
Resources, Conservation and Recycling	12	407
Sustainable Production and Consumption	8	117

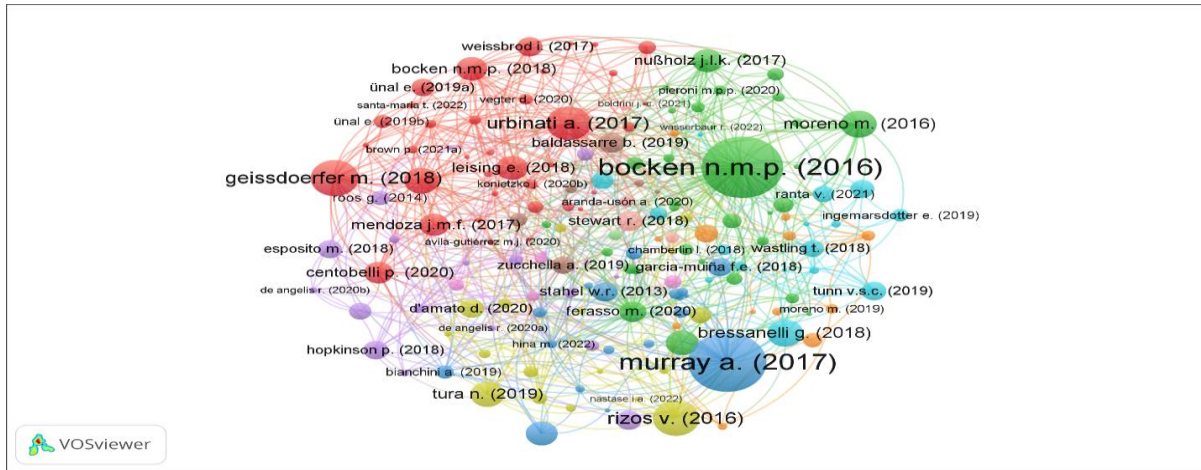
From the analysis of the geographical distribution of the literature about the circular economy and business models, it is noted that the publications are concentrated in the United Kingdom, the Netherlands, Italy, Sweden, and Germany as shown in figure 3. In total there are included publications from 44 countries, and this highlights an increase of global interest for the study of this concept.

Figure 3: Distribution of analyzed papers by countries

Source: Scopus; data processed by the authors

We use the Vosviewer program to visualize the connection between different citations and the impact of different authors. This is shown in figure 4. For the further analysis of the literature, the procedure recommended by Van Eck and Waltman (2022) was followed. Bibliometric analysis provides results based on quantitative properties and determines the relationships between terms, the best understanding of the studied concept. It also helps identify the most common connections between terms, as well as emerging terms that have not received much attention in previous literature. Focusing on the purpose of this study, exactly how the two concepts, circular economy and business models are related to each other and with other terms or even what are some research gaps, the study continues with the bibliometric analysis. In the first phase, the data of 189 articles were analyzed in a TXT file containing: citation information, bibliographical information, abstract & keywords, funding details and other information. The minimum number of repetitions of keywords was set at 5 and this resulted in 77 repeated keywords. In the second stage, terms that were not related to our research topic were checked and those related to the structure of the papers such as article, conceptual framework, literature review were excluded.

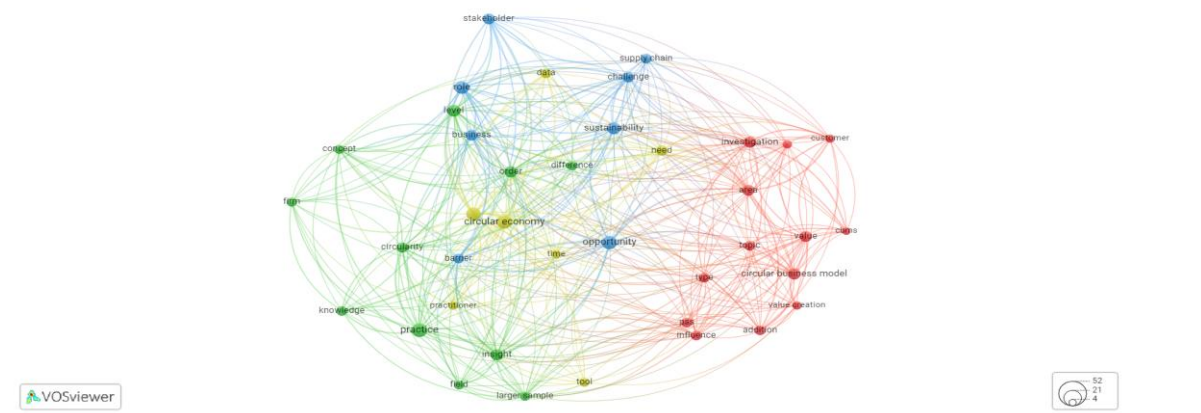
Figure 4: Map of relation between citations



Source: Scopus; data processed in VOSViewer

The map of key terms within circular economy and business model literature is presented in Figure 5. Based on the clustering procedure, the terms (articles) were grouped in 4 different cluster. The nodes of the network were the terms identified by VOSviewer according to their appearance in the papers with the five-times threshold. The third phase corresponds to the interpretation. As expected, the circular economy, sustainable development and business models are the largest nodes. From their side circular economy and business model terms have established key relationships with the terms: sustainability development, business model innovation, conceptual framework, supply chain, conceptual framework and recycling,

Figure 5: The map of key terms within the circular economy and business model literature²¹



Source: Scopus; data processed in VOSViewer

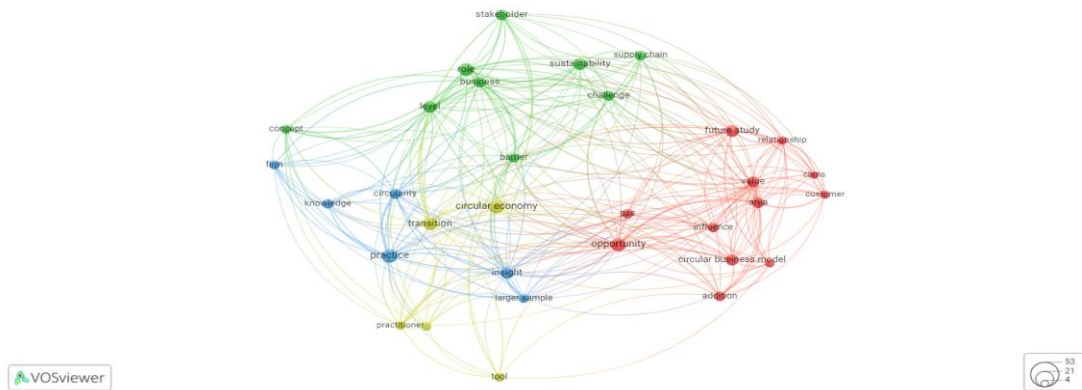
Ferasso (2020) highlighted several emerging topics, such as those connected with managerial, supply-side, demand-side, networking, performance, and contextual considerations of circular business models. Understanding how the business model can create value for the company by

²¹ Colour figure can be viewed at <https://tinyurl.com/278gfw8g>

creating value for customers is a never-ending challenge and topic of research (Centobelli et al., 2020).

So, this study brings a general theoretical framework where the study of concepts is focused on an emerging approach. The analysis continues with identifying the needs and gaps for further studies. After that, a summary of study suggestions regarding future research was made. Again, the data were analyzed with the bibliometric program VOSviewer, but this time to highlight key terms suggested for future research. The result is shown in figure 6.

Figure 6: The critical term map for further studies



Source: <https://www.scopus.com/sources.uri>: processed in VOSViewer

Table 4 summarizes emerging issues and some suggests for further researches related to circular economy and business models. There are also other keywords suggested by the authors, but in summary these are the most used.

Table 4: Suggestions for emerging issues

Emerging issues	Research issues related to business models and the circular economy	Authors
Practice	Re-examining the current theory about the circular economy and studying the implications of re-adapting economic and managerial practice.	Murray A., Skene K., Haynes K. (2017)
	Future studies will need to be done at frequent intervals to see how the environment changes in practice as business models move towards the circular economy.	Das A., Konietzko J., Bocken N. (2022)

Opportunity	Future research could study the impact of the circular economy in a global perspective. Investigations into the effects of CE strategies in general and CBMs in particular	Upadhyay A., Kumar A., Akter S. (2022) ; Bjørnbet M.M., Skaar C., Fet A.M., Schulte K.Ø. (2021) C
Transition	Further research is required to test the motives, conditions, opportunities and challenges during the transition to circular business models.	Nastase I.A., Negrutiu C., Felea M., Acatrinei C., Cepoi A., Istrate A. (2022)
Level	search for case studies that provide insight into the profitability and market feasibility of circular economy strategies at both product and company level	Chamberlin L., Boks C. (2018)
sustainability	Environmental sustainability should be assessed more thoroughly during the experimentation phases to avoid negative rebound effects Development of methods for assessing the environmental, social and economic sustainability of circulating products and business models.	Das A., Konietzko J., Bocken N. (2022) Bocken N.M.P., de Pauw I., Bakker C., van der Grinten B. (2016)
Circular business model	Finding and studying empirical evidence of circulating business models	Hina M., Chauhan C., Kaur P., Kraus S., Dhir A. (2022)
Stakeholder	How companies will address Circular Economy issues with internal and external stakeholders	Fonseca L.M., Domingues J.P., Pereira M.T., Martins F.F., Zimon D. (2018)
Product	Further studies should investigate Life Cycle Assessment as an opportunity for developing circular business models for companies that offer a variety of products.	Bjørnbet M.M., Vildåsen S.S. (2021)
Enabler	Study of circulating examples to bring a more balanced perspective on both the barriers and opportunities of CE implementation.	Cantú A., Aguiñaga E., Scheel C. (2021)
Business model innovation	Subsequent research should further address the need to overcome the prevailing approach of treating innovation as an afterthought and further deepen knowledge on the dynamics of innovation within a CE.	de Jesus A., Lammi M., Domenech T., Vanhuyse F., Mendonça S. (2021)

Barrier	Studying examples of additional circular economy taking a more balanced perspective on both the barriers and opportunities of CE implementation.	Cantú A., Aguiñaga E., Scheel C. (2021)
Challenge	Future research should delve deeper into the challenges faced in moving from linear to circular business models, shedding more light on barriers to CE implementation and testing whether the same challenges are encountered in different industries.	Colucci M., Vecchi A. (2021)
Supply chain	Inclusion of more case studies by conducting interviews with all interested parties along the supply chain regarding the technical limitations in material recycling at each link.	Zhang D., Huang X., Wen Y., Pooja T., Shanmugan J. (2021)
Consumer	A better understanding of how the importance of adaptation barriers varies between different consumer segments Research focus on the global trend of reluctance of individuals to own a product or rent it	Tunn V.S.C., Van den Hende E.A., Bocken N.M.P., Schoormans J.P.L. (2021) Ltd Hidalgo-Carvajal D., Carrasco-gallego R., Morales-alonso G. (2021)

Conclusions and recommendations

The present research contributes to the knowledge about circular economy and the business literature and brings a general framework in keywords and key concepts. The findings of this study are based on the bibliometric analysis of the network performed with VOSviewer, and the PRISMA method has also been applied. Vosviewer helps in a more straightforward presentation for studying key terms, the network of authors, and citations. The leading publishing journals were identified, and the progress of the articles over the years and the geographical distribution of the most cited articles are shown. Furthermore, the use of VOSviewer as a data mining tool for the selected papers facilitated the identification of promising research gaps to be explored in future research and allowed.

This study highlights the most important topics studied in recent years between the circular economy and business models and identifies the gaps in the literature and the authors' suggestions for further studies. The authors orient future studies towards: practice and implementation, opportunities that businesses have if they are directed towards the circular economy, analysis of monitoring the transition process, analyzing a large sample of case study, including attitude of stakeholders etc.

Limitation

First, this study considered only one database, Scopus, because of its prominence and inclusion of many indexed studies. Second, although recent research trends have been considered to propose future research avenues, those proposals have not been empirically examined. Third, this study is based on the occurrences of keywords. A deeper analysis of these concepts would be recommended.

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The challenge of sustainable development of the electrical system: The case of Albania

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Abstract

After the covid-19 pandemic and the consequences of the war in Ukraine, the world industry faced a rapid increase in the price of electricity, marking historical maximum values. This upward trend was maintained throughout the first half of 2022, marking the highest value in July 2022. Occurring in this situation, our country also faced an increase in the purchase price of electricity. The situation at the beginning of the energy crisis in the country became more complex also as a result of the problems that appeared in the administration of water reserves by the responsible public companies, but also the lack of operation of the Albanian energy exchange as an integral part of the electricity market model.

The objectives of this paper are:

- Knowing the environment of the Albanian electrical energy system*
- Identification of the challenges of the Albanian energy system*
- Identifying the good practices of other countries*
- Giving recommendations for addressing challenges*

This work is based on primary and secondary research. The interviews were semi-structured. Secondary data and interview findings were used to analyze and identify system challenges as well as draw conclusions and recommendations.

Keywords: Sustainable development, strategy of diversification, SWOT of electrical system

Jel code L9,O3, Q4,

The situation of the electric power system in Albania

After the covid-19 pandemic and the consequences of the war in Ukraine, the world industry faced a rapid increase in the price of electricity, marking historical maximum values. In the Hungarian stock exchange HUDEX, from June 2021, a slight increase in the price of electricity begins, undergoing an exponential increase in the following months, starting from 72 euros/MWh, and reaching the highest amplitude in December 2021, with 256 euro/MWh. This upward trend was maintained throughout the first half of 2022, marking the highest value in July 2022 with 359 euros/MWh.

The increase in energy prices in the international stock markets was also reflected in the economies of different countries. Occurring in this situation, our country also faced an increase in the purchase price of electricity.

The situation at the beginning of the energy crisis in the country became more complex also as a result of the problems that appeared in the administration of water reserves by the responsible public companies, but also the lack of operation of the Albanian energy exchange as an integral part of the electricity market model.

Table no.1. Price on the Stock Exchange and purchase from Albanian public companies (euro/MWh)

	Year	Jan	Feb.	Mar	Apr	May	Jun	Jul	Aug.	Sept.	Oct.	Nov	Dec
		23HU DEX	2021	50	42	43	60	61	62	66	70	78	150
	2022	12	14	16	19	22	23						
	2021						69	86	10	14	17	190	236
	2022	23	23	23	21	21							
	2021	51	51	51	51	51	51	11	12	16	27	278	234
	2022	25	23	23	23								
	2021	68	43	51	48	51	53	68	84	96	¹ ₇₈	223	256
	2022	25	23	33	23	23	23						
	2022	8	4	8	9	2	0						

Source:

<https://hudex.hu/en/>

23Source: <https://hudex.hu/en/> HUDEX price in the table shows the minimum price per month..

24 Source: KESH, processing by the authors

25 Source: OSHEE processing by the authors

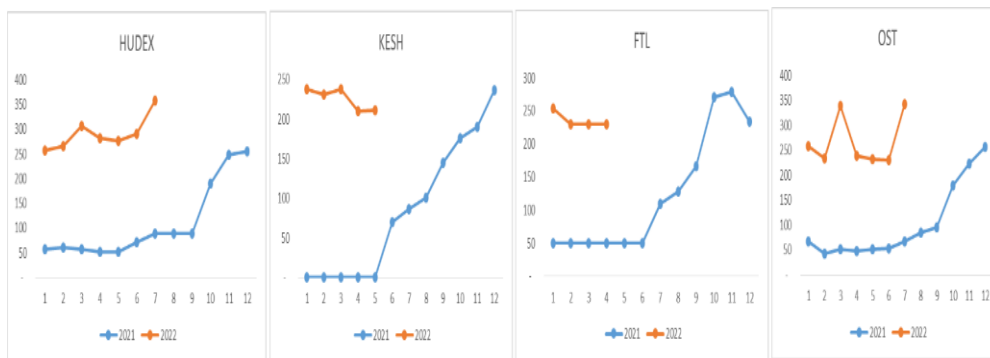
26 Source: OSHEE processing by the authors

The electricity purchase prices for the Albanian public companies, which were "caught" by surprise in this upward trend in the purchase price, put their liquidity in financial difficulty to afford the purchase of electricity.

For this purpose, the Albanian government financed the public energy sector companies KESH and OSHEE to cover the purchase of electricity in international markets.

The measures taken by the government and the activity of energy sector companies throughout 2021 and the first 6 months of 2022 are considered to some extent suitable for coping with the energy crisis, where the latter impacted the stability of the electricity system in the country and their financial portfolio, increasing the expenses for the purchase of imported electricity.

Figure 1: Price on the Stock Exchange and purchase from Albanian public companies



Source: <https://hudex.hu/en/>

Under these conditions, the Albanian Government injects 165 million Euros and 20 billion Lek into the electricity sector for 2021 and 2022 through financial instruments.

The purpose of this article is to study the challenges of the electricity system in Albania and to give suggestions for addressing them.

The objectives of this paper are:

- Knowing the environment of the Albanian electrical energy system
- Identification of the challenges of the Albanian energy system
- Identifying the good practices of other countries
- Giving recommendations for addressing challenges

Methodology

This work is based on primary and secondary research. The secondary research is based on the research of reference materials such as the regulatory legislation of the system, the periodic reports of ERE, the National Strategy of the Albanian energy system 2018-2030, as well as various articles for the identification of good practices.

The primary research is based on conducting interviews with managers of different levels of joint stock companies, of the electric energy sector and analyzing these interviews. To complete the objectives, to identify the challenges of the system, 21 interviews were conducted with crucial stakeholders. The interviews were semi-structured. The transcription was then followed by the analysis of the findings

Secondary data and interview findings were used to analyze and identify system challenges as well as draw conclusions and recommendations.

Organization of the Albanian Electricity System

1. Albanian Electric Energy Corporation KESH.
2. Electricity Distribution Operator – OSHEE Group.
3. Transmission System Operator – TSO.
4. Energy Regulatory Body – ERE

Organizational structure of the subjects:

KESH

The departments of KESH are:

Generation Department; Department of Strategic Development; Department of General Services; Department of Operation and Trade; Department of General Administration

The administration of the KESH company is organized on two levels.

The number of employees for each structural unit of KESH Sha.. is:

Has 700 employees; TEC Vlora 62 employees; Solar Energy 3 employees

OSHE Group

The company OSHEE Group, after the separation, has three commercial companies in its composition.

Distribution System Operator - DSO

Universal Service Provider – USP

Free Market Supplier - FMS

OSHEE Group has 7138 employees in its structure

OST

The OST company is organized in 6 Departments, as follows

System operation department; Finance Department; Department of information technology services and telecommunications; Department of Administration; Legal and corporate affairs department; Market Department. OST for 2021 has 798 employees in its structure and 806 for 2022

ERE

ERE is the regulatory institution of the electricity and gas sector in Albania that is run by the board. The board consists of the chairman and four members. The ERE administration has 63 employees.

SWOT of the Albanian power system**Tabel nr. 2 SWOT**

Strengths (S)	Weaks (W)
Organizational restructuring of public companies of the electric energy sector	Financial obligations carried over the years between public companies of the electricity sector
Alternatives to the financing of liabilities incurred for the clearing of accounting accounts, through their netting.	Lack of financial liquidity for many years, of public companies in the electricity sector
The injection of money by the government into the electric power system, through various financial instruments, to cope with the	High level of energy losses in the distribution sector.
	Lack of SCADA system centered at KESH.

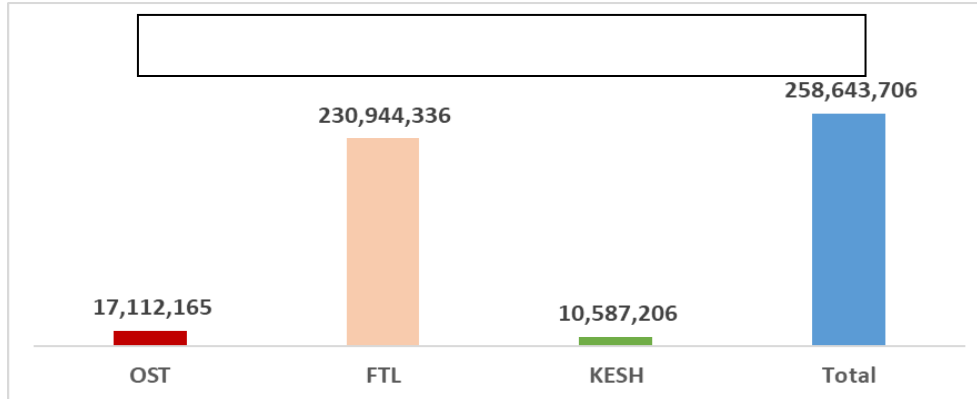
increase in the prices of imported electricity	Lack of certification with the ISO 27001 standard for information security in the electric power sector
Qualified staff in the companies of the Albanian electricity system	High debt of budget debtors against OSHEE Group
High investment in safety in the Drin River Cascade	Absence of the Albanian Electricity Exchange
Opportunities (O)	Threats (T)
Legal framework for the energy sector in accordance with EU directives	The increase in the price of electricity in international markets and on the stock exchange
Possibility of diversification of the generating portfolio	Hydrological risk in the electricity production sector
Loan support from domestic and foreign banks for the financing of the electricity sector	
National and regional development of electricity transmission in accordance with ENTSO directives	The increase of the frequency of cyber attacks on the critical infrastructure of public companies in the electricity sector

Source: Authors

Electricity balance 2021

The total net domestic production of electricity for 2021 is 8,962 GWh, of which 5,343 GWh or 59.6% was produced by power centrals owned by the public production company KESH sh.a., and 3,618 GWh or 40.4% was produced from other stations. From the analysis of the history of electricity production recorded in the country, it results that the year 2021 with the produced amount of 8,963 GWh, is above the average electricity production for the period 2009 - 2021. The average electricity production for the period 2009 - 2021 is 6,076 GWh. The production realized for the year 2021 is about 2,887 GWh or 47.5% higher than the average production for the period 2009 - 2021.

Figure nr. 2. Financial value of electricity import 2021

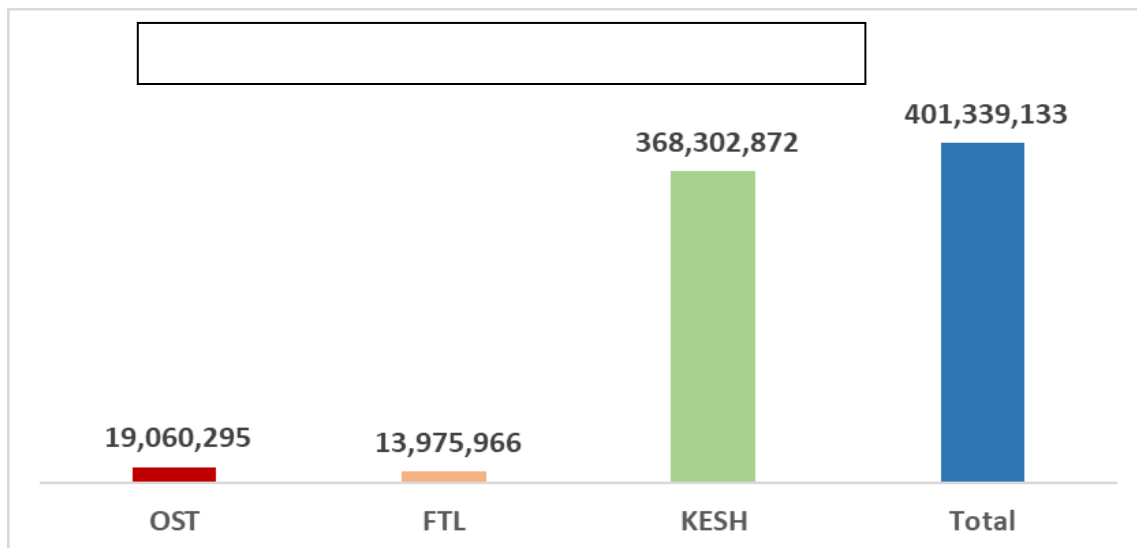


Source: Authors

As can be seen, in Figure 2, from the comparison between 2021 and the first 6 months of 2022, the import value has increased significantly, and in the first 6 months of 2022, it is 156% greater than the total import value of 2021.

The increase of generating capacities through the diversification of generating assets would bring the provision of all the amount of energy needed to fulfill the obligation of public supply, aiming to keep generation costs lower than the prices of international electricity markets. Combining the production of electricity from two renewable sources, such as the sun and water, is a very good opportunity to guarantee increased efficiency in production and to increase the security of the country's electricity supply.

Figure nr. 3. Financial value of electricity import 2022



Source: Authors

Best Practices

Denmark is the country that surpasses every OECD country in the use of clean and renewable energy, being the leading country per capita compared to OECD countries, also bioenergy plays an important role in the Danish energy system. Denmark uses about 50% of its energy produced by wind and solar energy. It produces almost twice as much wind power per capita as the second largest industrialized country in the OECD.

But wind energy is not the most used source of renewable energy in this country, as bioenergy ranks first followed by wind, solar and geothermal energy.

More than two-thirds of Denmark's renewable energy comes from bioenergy, which is energy stored in organic materials or biomass.

The world's leading innovators in wind energy are the Danish companies Vestas and Siemens Gamesa. These two companies had a third of the global wind turbine installation market in 2018, according to GlobalData data.

MHI Vestas - a joint venture between Vestas and the Japanese company Mitsubishi Heavy Industries - currently produces the world's most powerful 9.5 MW turbine.

Denmark began using wind power after the oil crisis of 1973. A nascent wind turbine industry emerged as a spin-off of agricultural machinery manufacturing, and the first commercial wind turbine was erected in 1979. The success of Onshore wind power inspired the development of offshore wind power.

With a total capacity of 407 MW, the 49 wind turbines cover the annual electricity consumption of around 425,000 Danish households.

Solar energy is another source of renewable energy in Denmark. Solar panels are used to heat buildings and produce central heating. In addition, Denmark has three geothermal energy facilities in operation, and geothermal heat is used for district heating.

In Denmark, outstanding results have been achieved in energy efficiency performance for households, industry and energy production.

The challenge of sustainable development of the electric power system and recommendations for addressing them

In addition to their efforts to consolidate the stability of economic and financial indicators, they face a set of challenges as follows:

- The activity of these companies is insufficient in the long term, since KESH, as an electricity production company, is still at the beginning of the process of diversification of generating assets with renewable energy and, therefore, found itself unprepared to face the energy crisis . KESH, apart from some initial initiatives to diversify into photo voltaic (PV) sources, has only finalized one project in 2022 and is far from the strategic objectives set for diversifying the portfolio of eclectic renewable energy generating assets.

- KESH must find a stable, efficient solution and in the shortest possible time put into operation the thermal asset TEC Vlora, which is currently conserved.
- The high level of losses in the electricity distribution sector, resulting in 21% for 2021 and 20% in the first 9 months of 2022, constitutes one of the main challenges of OSHEE-group, which must increase investments in infrastructure of the distribution system to influence the reduction of losses and within the year 2025, OSSH to implement the smart metering system.
- Should respect the protocols established for the administration of the water reserve in the Drin cascade and at the same time increase investments for the safety of the dams in this cascade, classified as critical infrastructure and of special importance for national security.
- Public companies of the electricity sector need to increase investments for the guarantee of information systems by following their security strike policies and certification with the ISO 27001 standard.

Certification with the ISO 27001 security standard of electricity system companies classified as critical infrastructure prioritizes the protection of customer data through implemented controls including product development according to security, data encryption, business continuity, disaster recovery plans and much more.

- Mainly, the free market society and that of electricity production should set up structures with high professional capacities in relation to the market study for the implementation of cost-efficient procurement procedures in order to optimize the costs of electricity import.
- The market model remains incomplete, until the Albanian Energy Exchange becomes operational.

In conclusion, the electricity sector, as a sector of special importance for national security, must diversify generating assets at an efficient cost, maintaining the environmental balance and guaranteeing the stability of the system and the uninterrupted supply of the electricity market in the country. The strategy of diversification of resources and assets would serve the sustainable development of the sector

Reference

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ERE 2021 Annual Report

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Law on Commercial Companies 129/2014

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National Energy Strategy 2018-2030

National energy and climate plan 2018-2030

<https://denmark.dk/innovation-and-design/clean-energy>

Leveraging Reverse and Open-Loop Supply Chain to build Circular Business models: A manufacturing company case study in Albania

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Abstract

This paper contributes to a circular supply chain business model that enables companies to act responsibly toward the environment through the increase in product reuse. This approach is because “everything is an input to everything else” and, based on the literature review, focuses on the backward flow of materials that will redistribute them to recover value. Some challenges that occur during the transition from forward to reverse logistics and their operations flow are addressed in this paper. We discuss the fundamental difference between the open-and-closed loop reverse supply chain based on the place where the used products are returned to. According to the literature, in a closed-loop reverse supply chain, used product returns to the original manufacturing company, while in the open-loop reverse supply chain used product returns to outside companies to recover value. While, in order to explain current practices of the supply chain business model in Albania, a furnishing manufacturing company that recovers wood wastes determines the survey-based research method of this paper. Ultimately, a framework on how to move towards reverse and open-loop supply chains was established based on the literature and empirical analysis.

Keywords: Open-loop supply chain, Product recovery, Circular business model, Case study

Jel Code: Q01, M1, O3

1. Introduction

According to the review of the literature, an increased number of papers are oriented toward sustainable development topics. Literature notes that recently companies are using a lot of used products and materials because of government legislation, increased awareness of environmental and concern about waste reduction issues from customers, the growing disposal costs, and due to recovery programs [15]. As such, used products need to be restored to useful life through e.g. the remanufacturing processes. As long as remanufacturing has some general characteristics that

complicate the supply chain and production system [17] and due to the global economy, cooperation between suppliers, environmental issues, and social issues, this paper chose the circular supply chain (CSC) topic to study.

Supply chain management (SCM) is considered a major element of competitive strategy to enhance organizational productivity and profitability [11]. When discussing SC, we implicate the physical movement of a product from the supplier to the end user, which is called the forward logistic.

The objective of this paper is to carry out a study of the theoretical framework related to the circular supply chain BM. Through the theoretical analysis, the concepts related to the circular supply chain will be analyzed with the aim of explaining them in an empirical case study. An illustrative example of the furnishing industry is provided to validate the applicability of the presented model.

Also, the aim of this study is to understand the similarities and differences between closed-loop with open-loop SC and to understand their position in relation to different contexts that create their business model.

In the following sections will be shown a brief review of the literature, followed by the methodology of the research and conclusions regarding CBM based both on empirical and theoretical analysis.

2. Literature Review

2.1 Circular economy and circular business model

Due to the finite resources and the linear production processes and supply chain, sustainable development issues arise, hence novel business models are discussed as a way to tackle these issues. According to the literature, a formal definition for CE doesn't exist, even though it is argued that CE aims to increase the efficiency of resource use to achieve a better balance between the economy, environment, and society. According to [15], CE is defined as the economic system that replaces the 'end-of-life' concept with reducing, alternatively reusing, recycling, and recovering materials in production/distribution and consumption processes. While the way toward CE is enabled by novel business models and responsible consumers [15].

Actors that may drive the implementation of sustainable development goals through CE are legislative and government bodies, NGOs, and consultancy firms [14]. Also, it is acknowledged

the increased rate of the practitioners' and scholars' interest in CE matters to close the loops of resources of materials [20].

As such, conventional business models require the adoption of CE practices to achieve the circular business model and to move toward a more sustainable environment, economy and society. Through the implementation of circular economy practices, the private sector can help achieve several sustainable development goals, boost development competitiveness and generate new jobs [2, 5, 23].

As regards to business model (BM) concept, it appears to have sparked many debates between scholars and practitioners, even though they have come to a consensus about the business model described as a system-level, holistic approach to explaining how firms “do business” and that seeks to explain how value is created, not just how is captured [27]. Relying on this last and CE definition, further elaboration is needed to understand how circular BMs are created. Based on the literature review, radical innovations are needed to foster circular business models to create a path to accelerate the development of a circular economy model. The private sector should rely on these solutions to move towards that path, such as: maximizing material and energy efficiency; creating value from waste; substituting with renewables and natural processes; delivering functionality rather than ownership; adopting a stewardship role; encouraging sufficiency; re-purposing the business for society/environment, and developing scale-up solution [4]. Circular business models are business models that incorporate CE principles, e.g. uses the 3Rs strategy: Reduction, Reuse, Recycle, or the 9Rs: Refuse (make product redundant), Rethink (intensifying the product's use), Reduce (increase efficiency in production or use), Re-use, Repair, Refurbish, Remanufacture, Repurpose (new product with different function), Recycle and Recover (incineration of materials with energy recovery) [17].

As long as the literature suggests CSC as the way of adapting CE principles, the following subsection will discuss supply-chain and will distinguish forward with reverse logistics that enable the business model to become circular.

Forward supply chain

Referring to the literature, the scope of the supply chain is related to the physical movement of material beginning with the supplier and ending at the point of consumption, subsequently extending the concern for the information flow: e.g. supplier management, purchasing, materials management, manufacturing management, facilities planning, customer service, and information flow as with transportation and physical distribution [7]. Actors of the supply chain network are a set of suppliers, manufacturers and distribution centers as the nodes and a number of links between them as the arcs of the network [6]. As such, the main objective is the development of an integrated

supply chain to balance customers' needs (high customer service) with the flow of material from the supplier (low inventory cost and cost per unit), which most of the time require a trade-off of these lasts [7].

Furthermore, research highlights the importance of creating a collaborative relationship with suppliers in order to move forward and enhance the total performance of the supply chain, so it can improve value to the customer [24].

As long as used products need to be recovered, they should re-enter the SC, so it can create the loop of the supply chain. The design of the recovered product will directly impact the value chain and inevitably signifies a fundamental change in the practice of the design of the supply chain [8]. As such, it is required to study the supply chain for these used products and the processes followed in order to manufacture the same or other goods. The following subsection will discuss reverse SC and the types that deal with sustainable development issues.

Circular Supply Chain through Reverse Supply Chain

To begin with, it is necessary to define the term “loop” in the supply chain context and then identify CSC concepts. According to the review of the literature, the forward logistics mentioned earlier in this paper forms a loop when reverse logistics joins this last to recover products. A reverse supply chain focuses on the backward flow of materials from customer to supplier, focusing on maximizing the value of products and contains processes of collection, testing, transportation, and processing [21].

The reverse supply chain should be taken into account during the design of the location and capacity of warehouses, plants, choice of outsourcing vendors, distribution channel, and supporting technology [21]. Rather than speed, the reverse supply chain uses inventory management as an important element to consider when managing operations, because of their chaotic inventory.

Reverse supply chain literature uses different terminologies like green SC, closed-loop SC, and environmental SC, and is found that all of them contribute to the triple bottom line [9]. While, the main types of the reverse supply chain include closed and open loop SC [8].

According to the literature review, a closed-loop supply chain starts with product acquisition, inspection, disposition, and refurbishment, and ends with redistribution and sales, all those processes organized by the original equipment manufacturer (OEM). The way in which the used product is returned from the customer to the original supply company is through the product return process. The reasons behind product returns from customers are end-of-life products, faulty products, and obsolete items [12]. Reverse logistics appeared to have gained much attention due to the strategic approach used with their customers and its positive impact on revenues [21].

Within a closed-loop supply chain, returned products can follow different flows when returned back to the chain e.g.: items can be reused through repairing or reconditioning steps, products can

be refurbished through remanufacturing or returned products can be recycled to continue with reproduction. Another definition of a closed-loop supply chain refers to the SC when remanufactured products are accepted in the primary market alongside “new products” [3]. When used products are returned to the OEM focus goes to the entire product recovery and the SC is integrated with the reverse SC. Also, OEM is the focal point of the SC (it recovers the product or outsources this operation) and the recovery product is then sold in the primary market [3].

On the other hand, in the open-loop supply chain used products are not returned to the OEM but can be used in other industries [21]. The open-loop supply chain is described also as an SC to satisfy the demand for remanufactured products of a secondary market when these products are not accepted in the primary market alongside “new products” [3].

On the OLSC focus goes to material or component recovery, rather than the entire product recovery, as mentioned at the CLSC. The recovery of these products is an action taken by other independent actors (OEM is peripheral). In this context, a wide variety of products are produced and the SC is independent of the forward SC, which means that serves new purposes as long as is sold in other independent markets [3]. It is argued that OLSC when depicted as a reverse supply chain, replaces the forward SC and the linear economy take-make-waste.

According to the literature, both closed and open-loop SCs rather than dichotomous should be viewed as a complement of each other that facilitate the way of moving towards CE [3]. Based on previous studies, is found that CSC is neither CLSC nor OLSC, but is an integration of both, depending on the context. This means that all the different characteristics mentioned above for CSCs vary on a continuum for different cases, where at the end of the continuum CLSC and OLSC appear [3].

Challenges of moving towards reverse logistics

The profit objective of the economic units needs to be addressed when discussing environmental issues and actions that they should take to reduce the negative impact of their operations. Literature suggests that moving towards circular business models is a strategic approach to customers, is positively related to revenues, and is viewed as a competitive advantage in the market. Should mention also that CSC has existed since 1920 for extending product life (e.g. automotive parts). On the other hand, according to the literature companies are faced with challenges when implementing a circular business model.

When referring to the CLSC or OLSC, the company has to carefully design, plan, and control. In order to implement the suggested model is determined to find the location of distribution centers, recycling centers, collection centers, and the number of transferred products between levels [26].

The CSC approach also requires sophisticated technology to capture the supply chain footprints and measure sustainability performance indices in the reverse chain due to increases in complexity [1]. Through the investment in technology information flow, visibility, speed, and integration along the supply chain are achieved. Furthermore, trust, transparency, and collaboration are promoted. Literature, suggests the use of Big Data, the Internet of things, or Cloud Computing in order that continuous updates on industrial scenarios are provided and to access operationalized data on a consumer's perspective on products, providing implications and insights for reverse supply chains [1]. IT system integration tackles the weakness of lack of visible processes for returned products and smoothers data transfer.

Related to the managing processes, companies should design their operations in such a way that waste is reduced completely, resources are kept in use continuously by ensuring that unavoidable waste is recycled and recovered, should design their products based on circularity, etc. [1]. Furthermore, the literature suggests the use of return agreements with suppliers/ manufacturers while at the same time a configured system such that these options are easily accessible, and staff need to be trained to use them consistently [1].

3. Methodology

In order to better understand SCM a case study approach and literature review were employed. A case study approach is the most suitable in situations where the main research questions are depictive and the broad perspective afforded by this approach is best suited to yielding maximum insights [25]. Opportunities exist to use survey-based research methods to explain current practices, predominant and critical issues, and managerial techniques used to manage the reverse SC [19]. To do so, a furnishing manufacturing company implementing a circular business model in Albania is selected in order to explain the practice of the CSC.

Because of the CE principle to use renewable over non-renewal materials, the furnishing manufacturing company is chosen as long as relies on the use of wood for the manufacture of goods. Other empirical studies showed that the use of 100% wood waste was more sustainable because of a global minimization of potential impacts. As such these findings may assist furniture and wood-based industries in improving their environmental profile [13].

Case study

Alpha, a recycled content wood furniture manufacturer, is a green business model based in Albania that combines both entrepreneurship and sustainable development issues, that covers a high variety of products depending on the client's demand with a high-quality result. The company has attracted a wide range of clients throughout Albania: starting from families and continuing with businesses and has over nine years of operating in the national market.

The business model of this company is oriented towards social and environmental matters by the change of physical form, reprocessing, and modeling of the wood waste into many accessories, for interior furnishings. The latter may include furniture, furnishing accessories, decorations, or any other product or art, namely repurposing their function.

Related to the supply of raw materials, the company has a stream of resources such as wood wastes of organizations, individuals' collection of used wood products, households who communicate directly with the company for wood products that are at the end of their life or will no longer be used, etc., thus creating a large network of suppliers. Namely, includes multiple local collection points and when joined together these products enter the centralized center where testing, refurbishing, or recycling processes happen.

The recycling process through which these wastes pass, includes cleaning, joining, and sanding, leaving the turn to other processes customized accordingly to the clients' request. As long as this material (wastes of wood) is difficult to be dealt with, the timing to process is at least three times higher than normal material.

Subsequently, the supply-chain business model then extends to the sale to the final consumer. Meanwhile, these manufactured products may be used by hotels, bars, restaurants, households, and more, all over the country of Albania where the customers are geographically present (around 500 clients).

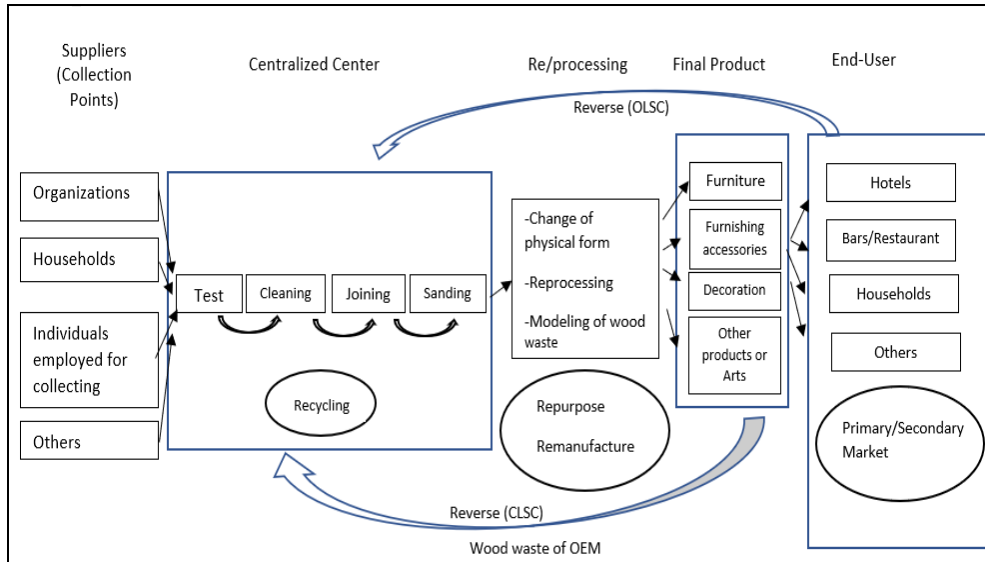
Also, when the company receives orders from large customers (such as businesses), the leftovers from that order are often re-used by this company to reproduce products for other orders. Hence, the company itself creates a reverse supply chain/CLSC that re-introduces its wastes into the reproduction process.

Based on this case study, it is notable that the company bases its economic activity on the circular economy concept and through this concept has launched its business model, focusing on recovering products and reducing wood waste.

Furthermore, Figure 1 represents the business model of the empirical study based also on the literature review mentioned above for the CSC (OLCS and CLSC). Alpha company seems to have leveraged reverse SC to establish a CSC BM, starting from a network of suppliers and ending with the secondary and primary market of the recovered products. It looks that its business model is based on the strategy of remanufacturing, repurposing and recycling.

It is noted that this company uses the OLSC concept as long as the products of other companies are recycled, repurposed, and re-entered into the remanufacturing process. Furthermore, is perfectly aligned with the OLSC characteristics, as the materials and components are reprocessed and not the entire product. On the other hand, Alpha sells a variety of this product to the secondary market, not the primary market they were designed to first.

Figure 1: Conceptual framework of Alpha Company



Source: Author's processing (2022)

Furthermore, as mentioned earlier Alpha manages to reduce its own waste and reuse it for the remanufacture of products. According to the literature, this is called the CLSC since it is OEM that recovers its own product. On the other hand, this business model does not have the pure characteristics of the CLSC but is located beyond the extreme point in the CLSC's continuum. The reason is that Alpha does not recover the entire product, but the materials and the components. Meaning that company moves towards the characteristics of OLSC's BM. Moreover, remanufactured products can be destined for a completely different market from the reused product, depending on the order received from the customer. In this case, this product may be reused by the primary or secondary market. Even though the pure characteristic of OEM being the focal point is achieved through this BM.

Regarding its CBM company uses the strategy of recycling, remanufacturing, and repurposing.

Namely, Alpha manages to use both CLSC and OLSC as their BM and at the same time as a way to achieve the triple bottom line: economic, environmental, and social balance.

4. Conclusion and Discussion

This paper contributes to the existing literature by depicting successful practices for CSC being implemented in the furnishing industry. Due to the changes identified in the SCM, new processes related to the CE strategy are necessary for employment to close the material loops.

Referring to the review of the literature and the case study, CSC is a concept that is put into practice in Albania by Alpha company and has operated in the market for over nine years. Alpha company creates value as it has created collaborating relationships with a different collection points for used products, leading to the development of CE and sustainable development issues.

Should note that Alpha asserts the theoretical framework mentioned above in the literature review [3], that neither CLSC nor OLSC can exist isolated from each other when creating a circular business model for SC. As shown in the case study, the company implements both of them, and they are represented as complementary to each other. This case explains that both of them should not be viewed as dichotomous rather than as counterparts of each other and as facilitators for CE.

Hereupon, should be added that one company may have different characteristics of the CSC depending on the location in the continuum of two extremes: CLSC and OLSC. Also, by the framework represented above a better understanding of the remanufacturing processes that used products have to go through is achieved. This search also brings light to scholars about barriers and ways to overcome them in order to move towards the CSC, encouraging other authors to search for other alternatives for promoting cleaner production of furniture components from a life cycle perspective [13].

Further Research

Since the study was conducted in only one company in the furnishing industry, there is room to use other companies within this industry to see the applicability of CE. Furthermore, the selection of other industries is required to identify the relationships that may exist between different supply chains and the practices of CE created among them.

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The transformation of banking industry and new growth opportunities in Albania

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Abstract

Albanian economic and political transition in the early 1990s have contributed to several improvements for citizens: standards of living have improved, and labor market is transformed, following the industrial transformation process. Albanian economy has expanded rapidly in the 2000s due to the economic openness, the deregulation of factory and output markets, and the privatization process. Over the last decade, despite all the macroeconomic policies undertaken from the authorities, the productivity growth has remained weak, while marginal labor productivity and total factor productivity have both declined. The slowdown of the global economy, as a result of the Covid-19 period and the recent political instability impacted the macroeconomic developments of Albanian economy. Industrial transformation, was one of the factors that mostly contributed to the slow recovery after the shock of Covid-19 in Albanian economy, in terms of digitalization and globalization of markets creating new growth opportunities. The integrated impact of the challenges of the COVID-19 pandemic, economic and social issues, made the approach that the banks immediately embraced towards innovation and digitization of banking services, re-shaping the future of the banking industry in Albania. This study aims to analyze the factors that contributed to the industrial transformation in terms of digitalization, focusing the analysis in the banking industry in Albania for the last decade. Also will be provided an analysis of the role of the digital transformation in economic growth and sustainable socio-economic development, to evaluate the potential of this industry for new growth opportunities in the future.

Keywords: Economic growth, industrial transformation, digitalization, banking industry, socio-economic sustainable development

Jel Code: O43, O33, O14

Introduction

The slowdown in the world economy as a result of Covid-19 and the political disability, had its impact on the Albanian economy, putting the firms, government and the consumers under pressure. For all actors, except to cope with the unusual economic situation during COVID-19, the most important task was to coordinate their decisions in contributing to the reshaping of economic growth model, that wasn't predicted very promising (Albanian Association of Banks, 2020). Albanian government and Bank of Albania reacted very fast in the first months of the start of pandemic COVID-19, through the adoption of various financial guarantees and the creation of loan repayment moratorium programs, but banks suddenly found themselves as a powerful catalyst for much-needed transformation in the financial industry. The optimal capitalization of banks, sufficient liquidity and the moderate level of non-performing loans were an achievement for the banking industry in the first year of the pandemic, to mitigate the effects of economic slowdown as a result of the restriction of movement (Bank of Albania, 2021).

The integrated impact of COVID-19 pandemic challenges, economic and social issues, oriented the banking industry to focus on innovation and digitization of banking sector services, and to reshape the future of the banking industry in Albania. In the last decade digital transformation of the banking industry in Albania has been running at a relatively satisfactory positive rate compared to other industries (Bank of Albania, 2021). During 2021, it was registered an increase in the use of all electronic payment instruments such as home-banking, mobile-banking, and electronic money. In the meantime, it was registered an increase of number of POS, ATM, and cash-in ATM. All these positive trends, increase the Albanian banking industry impact on the country's sustainable socio-economic development in the future. Albanian businesses, have also made important steps in terms of digital transformation. Meanwhile, it was registered that about 45% of businesses had a website, although only 38.3% of them used it to make purchases or online reservations (INSTAT, 2021). Kalaj and Merko (2021) show that digitalization – measured in terms of enterprises' adoption of high-speed internet and website use – does affect the enterprise labor productivity. Policymakers on the other hand, influenced by all socio-economic indicators, have also oriented their investments in the process of digitalization of some public services, offering easier access and reducing costs for users. (For example, e-Albania). In order to approach the bank and government expectations, for investing high capital in innovation and digitalization, to client behavior towards digital services, it is important for researchers to study the factors that have contributed to the transformation of the banking industry in Albania, in the direction of digitalization of services, creating new growth opportunities in the future.

This article is organized as follows: the second section briefly presents a literature review; the third section presents tools and methodology used; the fourth section frames the transformation of banking industry during the last decade; the fifth section presents the role of Bank of Albania and government in transformation the challenges; and sixth section analyzes the challenges that banking industry will still face in the next decade; and in the last section are presented the conclusions.

Literature review: relationship of banking industry and economic growth

The bilateral relationship between the development of the financial industry and economic growth is a widely discussed issue in literature. Researchers are motivated to study this relationship not only because of the importance of financial sector to the country's economic development, but also because of the need for policymakers to coordinate Fiscal policies with the Monetary one to get better results in terms of economic growth.

Researchers who have considered the bilateral relationship that exists between the development of financial industry and economic growth are divided into two main groups. In the first group, are those researchers who support the results of the Schumpeter study (1911). Schumpeter is among the first economists to emphasize the importance of the bilateral relationship between financial industry development and the country's economic growth, and underlined the role of the financial system and its services as key elements that promote economic growth, through channeling the funds and savings towards more productive investments (Levine, 1997). In the second group, researchers support the findings of Robinson's studies (1952), which builds on the idea that the country's economic development is the one that positively affects the growth of financial products, and as a result of this, the country's financial development simply follows its economic growth.

On the other hand, Patrick (1966) identified that the link of financial development and economic growth is apparent, analyzing the bilateral relationship. The first direction he analyzed was called "demand following", which states that increasing demand for financial services depends on the country's economic growth, marketability and modernization of sectors of the economy, so it is precisely the development of the economy that affects further financial development. While the second direction that Patrick (1966) analyzed, was called supply-leading, it concerns the fact is the financial sector, innovations and its developments that influence the development and stimulation of economic growth. Goldsmith (1969) stated that this positive relation is mostly influenced by the positive impact that the financial development has on efficiency rather than the volume of investments, but failed to prove whether there is a causal link ranging from financial development to economic growth. Also, according to the empirical literature, attitudes are in the same line with the theoretical discussions mentioned above. In interest to this study, is the fact that a good part of the empirical studies that deal with the relationship between these two indicators made for groups of countries, or for individually countries, affirm for a positive link between financial industry development and economic growth but do not look in detail at the direction of causality between these indicators (Goldsmith (1969), Levine and Zervos (1998), Levine (1998, 1999), Levine, Loyaza and Beck (2000)).

In the case of Albania, the empirical studies of the Bank of Albania present important evidence on the link between the country's economic growth and financial development in Albania during the period 2002-2016, based on the approach of time series, where both the indicator of economic growth and the one measuring the country's financial development are treated as endogenous indicators. The results of these studies show that economic growth and financial development are co-integrated in the long term, therefore development, expansion and deepening of the financial market is very important for economic growth. An important contribution has also given various scholars of the country in their efforts to assess the long-term relationship and the causality

between financial development and economic growth, such as Dushku (2010), Yzeiraj (2016), based on the approach of time series, and Rama (2016), based on estimates for a group of countries including Albania. Also, the latest study of Sejko (2018) state that developments in the financial market and real market are closely positively related to each other in the long-term.

The last global financial crisis and pandemic COVID-19 once again witnessed the role of the financial system, and the importance of dealing with its connection to the real economy. Therefore, researchers' efforts have increased their contribution on analyzing and confirming the link between the financial sector and the real sector, especially for Albania, where the financial sector (banking) takes an important weight with its contribution to the economy.

Tools and Methodology

This paper aims to analyze the factors that contributed to the industrial transformation in terms of digitalization, focusing the analysis in the banking industry in Albania during 2011-2021; evaluating the importance of the potential of this industry for new growth opportunities in the future.

For realizing the main object of topic we have used a considerable national and foreign literature, including research in library and online sources.

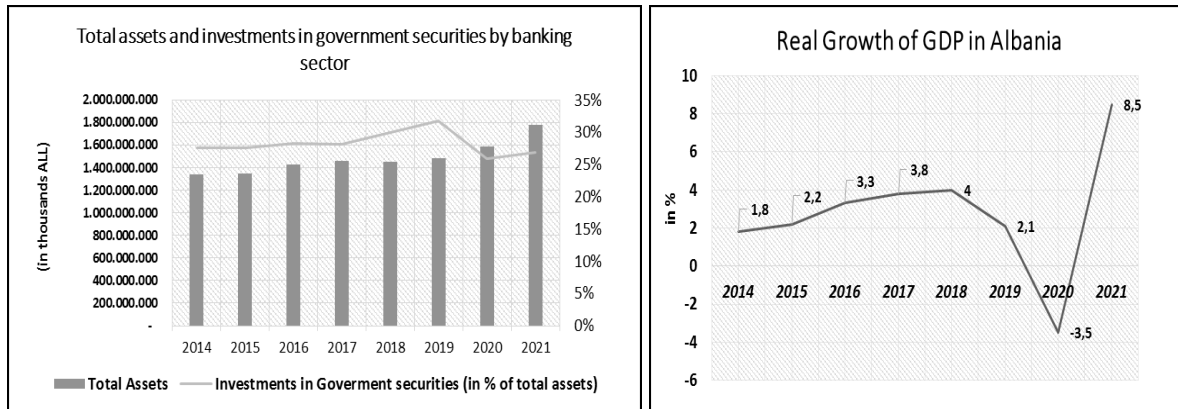
We have collected the data from published reports and paper work from Bank of Albanian official website; from periodical magazines published from Albanian Association of Banks; from World Bank statistical database etc. A descriptive and comparative analysis is used to realize the objective of this paper.

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Transformation of banking industry in Albania

The development of Albanian banking industry, during the last decade, is closely related with the overall political and economic developments, with an increasing contribution to economic development and macroeconomic stability. For the same period of time, Albanian banking system has been developing many modern banking services and products, ranging from credit cards, to e-banking/mobile-banking and e-commerce (Albanian Association of Banks, 2020). The Albanian banking sector has maintained a growing trend of total assets, investments in Government securities, net profit, thanks to healthy financial conditions. Meantime, there was a positive real growth of GDP over the last decade, except to the year 2020, when the pandemic COVID-19 started (World Bank, 2021). (Figure 1)

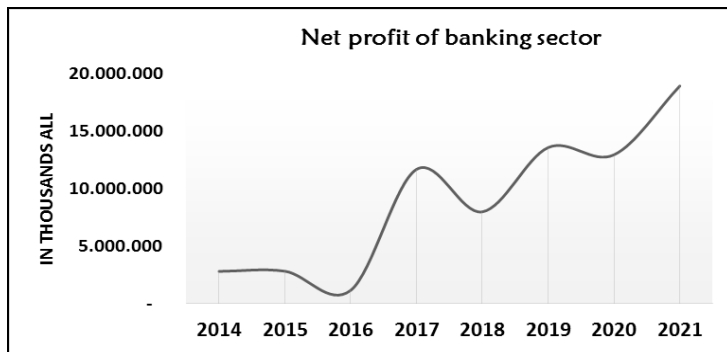
Figure 1: Total assets of banking sector, investments in Government securities (left); Real growth of GDP in Albania during 2014-2021 (right)



Source: Albanian Association of Banks (2021)

Source: World Bank (2021)

In 2021, total assets for the entire banking system amounted ALL 1.8 trillion, with a considerable growth during the last (an average growth of 24.55%, from 2014 - 2021). The support of Albanian banking sector to invest in Government securities also increased, (an average growth of 22.44% from 2014 to 2021), thus based on these data the banking system has been the main funder of government debt in our economy in the last decade. Economic activity in Albania, presented in the right position of Figure 1, marked a rapid recovery a year after the launch of the COVID-19 pandemic, which was measured in the increasing of the volume of economic activity, the improving of business balances, the increase of total employment, raising of wages in most sectors, as well as strengthening domestic inflationary pressures (Bank of Albania, 2021). Albanian financial industry as well supported the economic recovery during 2021. According to the data reported by the Bank of Albania in the 2021, the indicators on liquidity, healthy bank balances, as well as restoring confidence had a major impact on the recovery of the economy. The monetary stimulus, followed by Bank of Albania, which was materialized into lower financing costs in all market segments, caused a significative increase of lending (an average by 8.4% (the highest rate of growth since 2012)), while the basic interest rate remained at its lowest historical levels of 0.5%, and the volume of liquidity injected into the system increased.

Figure 2: Net Profit of Albanian banking sector

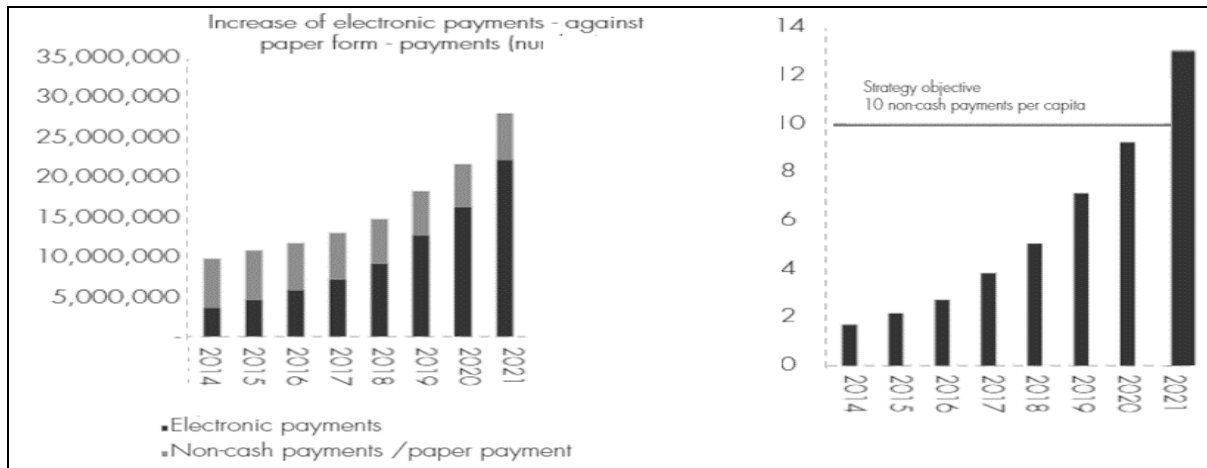
Source: Albanian Association of Banks (2021)

Because of these measures, all actors of financial industry, reported an expansion of their balance sheets and, in general, better income from activity. This increase is reflected in the increase in the weight of the financial system against GDP by 1.4 percentage points compared to a year ago.

Considering the data from Bank of Albania, although the overall net profit and lending of Albanian banking industry to the private sector and individuals has increased from 2014 to 2021, still the empirical assessments made by researchers show that the credit channel is not fully efficient (Figure 2). High liquidity in the banking system, which is used mainly as a protective instrument, depending on its size can diminish the efficiency of the bank loan channel, as in the case of Albania (Bank of Albania, 2021).

The pandemic Covid-19 was one of the main factors that contributed to the long-awaited change in consumer behavior towards digital services, reshaping doing business for firms but also for the banking industry. Policies undertaken by policymakers in coordination with the Bank of Albania for supporting the digitalization initiative undertaken by the banking industry appears to have given its effects to the support of the digital transformation process. During 2021, Bank of Albania reported for an increase of the electronic payment instruments with 29.51%, comparing to the previous year. Also, the volume of these transactions has increased by 20.62%, comparing to the previous year (Figure 3).

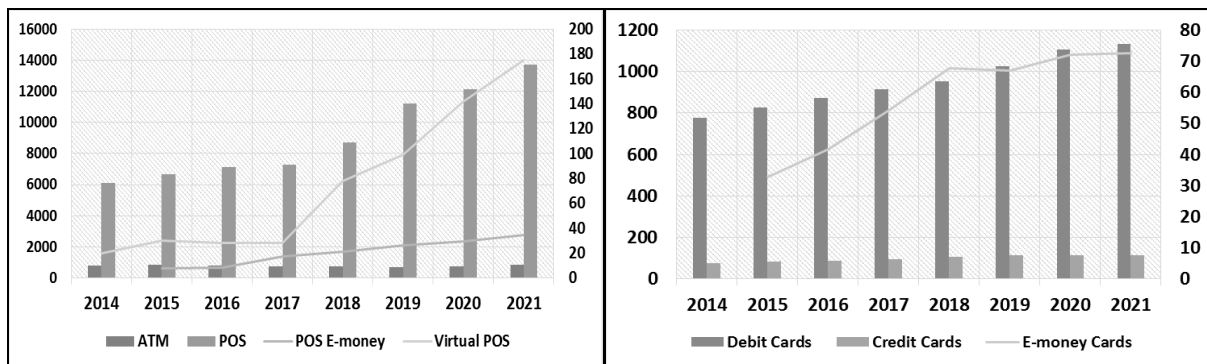
Figure 3. Volume of electronic and paper payment instruments in years (left) and the volume of payments per person (+15 years-old) in years (right)



Source: Bank of Albania (2021)

Developments in electronic payment instruments throughout 2021 have also contributed to meeting the quantitative targets of the National Small Value Payment Strategy (2018-2023) approved by Bank of Albania. A very positive achievement, is the exceedance of the index of use of electronic payments per capita, which reached the level 12.5 out of 10 payments that is the target under the National Small Value Payment Strategy (2018-2023), presented on the right of Figure 3. In total, in 2021 the number of payments with electronic money marked a significant increase in both number and value, respectively by 79.04% and 44.8%. The addition of electronic money institutions has brought a wider extent of terminals to the territory of the Republic of Albania, bringing amenities in the form of increased flexibility for the conduct of payments, as well as a lower cost for payments committed (for payments of fines, monthly utilitarian bills, etc.)

Figure 4. Developments of ATMs /POS (left); developments of debit/credit and e-money cards (right)



Source: Bank of Albania (2021)

Also, positive developments were marked as part of the expansion of the percentage of the population, which owns a payment account. In 2021 it resulted in about 69% of the population of older age own a payment account, significantly approaching the 70% target set in the national strategy mentioned above. In the meantime, it was registered the increase of the use of electronic payment instruments such as home-banking, mobile-banking, (with an increase of 46.78% compared to 2020), the increase of number of POS (an increase with 13.12% compared to 2020), the increase of the total number of ATM (by 11.38% compared to 2020), as well as the number of cash-in ATM (Figure 4).

Regarding to cash transactions, conducted by customers at banks' cash windows, during 2014-2021 we observe a decrease in number and value. But for 2021 the cash deposit transactions increased both in number and value, respectively by 3.86% and 18.31%, compared with the previous years. The use of cash in the Albanian economy still remains a prevailing phenomenon, which carries high costs for banking industry, as an unexploited base of clients, and for the economy in general as well. In this framework, for the next decade is recommended the coordination of efforts at market level from Bank of Albania and policymakers, to encourage the use of efficient instruments at low costs for the next decade.

Role of Bank of Albania and government in transformation

The challenges presented to the banking industry in the COVID-19 pandemic period accelerated the measures taken from Bank of Albania and government to promote the use of electronic instruments. These measures were mainly related to the elimination of costs for the use of home-banking services, for carrying out remote transfers by bank customers in the national currency, for a two-month period, and reinforced with revisions to the regulatory framework for the operation of the AIPS and AECH system in June 2020.

In coordination with the adoption of laws by policymakers regulating this process, Bank of Albania has been working to implement the action plan of the National Small Value Payment Strategy (2018-2023), with the aim of modernizing this market and expanding the financial involvement of the population and the use of electronic payments on the Albanian market. The measures taken further focused on home-banking services, and accompanied by the elimination of tariffs paid by banks to the Bank of Albania, in order to compensate for the costs, they have for providing these services. The financial inclusion of the population and the reduction of physical money in the economy has turned into an important priority for the Bank of Albania and the National Payment System Committee, for achieving the goal of avoiding informality and increasing transparency in the economy. The adoption of law 55/2020 "For payment services" is considered a very important achievement in this direction, as it includes in the legal framework of the financial field as an important directive of the European Union, of PSD (Payment Services Directive). Therefore, it is estimated that the law "For payment services" can affect the financial and economic system through its three main effects: first, promoting competition and creating innovative financial services; second, the best consumer protection; Third, the expansion of the representation of payment services institutions throughout the territory of the Republic of Albania. From the

customer point of view, this scheme will create flexibility, enabling the use of the instrument, regardless of whether the bank/nonbank financial institution has agreements with the utilitarian company in which the customer wants to make payments. Also, the Direct Debit Regulation and the Payment Services Act create a prudent framework for consumer protection. All these measures will certainly have to be supported with the increase of necessary financial education, to facilitate the transformation process and speed up the completion of this process (Bank of Albania, 2021).

Challenges of the banking industry in the process of digitalization

The highlighted challenges during the COVID-19 pandemic revived the need for the engagement of all actors, with the aim of facing challenges towards financial education, as well as promoting financial inclusion and the use of electronic payments. The challenges that the Albanian banking industry is expected continue to face in the next decade relate to: *technological and innovative adaptation, informality, financial education, meeting the regulatory framework, and cyber security* (Albanian Association of Banks, 2020).

In the function of these challenges, almost all banks have *increased their investments in the innovation and digitization of their services* (Albanian Association of Banks, 2020). However, analyses in this field show that there is a high unexploited potential in this direction, to increase the contribution the Albanian banking industry to the economic growth. The banking industry's approach to digitization and the introduction of FINTECH in the market, mainly in the field of payments, has created a new task for banks: *to revise their business model and to adapt fast*. Despite the positive trend in the use of banking instruments as a whole, the banking system will continue to insist on increasing the number of users, especially small and medium-sized business, for whom the mainly reason that they still resist to use these products are related to costs, procedures and their level of financial education. Also, *the level of informality*, especially in coastal cities, remains a stumbling factor for achieving banking industry objectives in digitization process (Albanian Association of Banks, 2020). The Albanian banking industry will continue with its goal of *increasing population and business access to banking services, through financial education and increasing confidence in the banking sector*. In fulfilling this objective, Albanian banks are recommended to continue working with the increase of banking transparency, on the costs of banking and card services, as well as revising the banking and maintaining commissions on these instruments. Referring to the challenge of *meeting the regulatory framework in approximation with the EU regulatory framework*, despite all the positive steps taken by the Bank of Albania, it will continue to seek considerable contributions from all Albanian banks. The entire adaptation process is expected to positively affect the reduction of execution time of transactions and bring about improvements in the bank's performance against customers, adding new value to the entire financial market, benefitting banks and customers. Last but not least, the *fight against cyber-attacks* will undoubtedly continue to be a concern for the Albanian financial industry, and will push them to find more protective instruments and be more vigilant, to ensure a more robust protection on the network.

Despite all the challenges mentioned above, Albanian banking industry will continue to play a fundamental role in the development of economic responses, including employment assistance and financial support and to increase its contribution to economic growth in the future.

Conclusions

Digital transformation of the Albanian banking industry has been running fast, increasing the role and positive contribution to Albanian economy. The integrated impact of COVID-19 pandemic challenges, economic and social issues, oriented the banking industry to focus on innovation and digitization of banking sector services, and to reshape the future of the banking industry in Albania.

Albanian government and the Bank of Albania reacted very fast in the first months of the start of pandemic COVID-19, through the adoption of various financial guarantees and the creation of loan repayment moratorium programs, to help citizens, businesses and the economy overcome the difficulties created by the pandemic health emergency, the role of banking industry was very important to serve as a powerful catalyst for much-needed transformation in the financial industry.

Despite all positive steps made in the last decade, more coordination of decision-making between the Albanian government and banking industry is needed because of the ongoing challenges.

Firms and consumers, with their decisions in difficult and unprepared circumstances, showed that they are available to adapt their behavior to the new doing business model, so banking sector is now the key actor to facilitate the creation of the new growth model for Albanian economy.

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Towards a Green Procurement Policy (GPP) and Resource Efficient and

Cleaner Production (RECP) assessment tool for the textile and footwear sector in Albania

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Abstract

The fashion industry requires and is currently using many resources, starting from the raw materials to the final product, until the end user- the consumer. During the last two decades, retail, or the “fast fashion” trend, has radically transformed the global market. This industry operates clearly in the linear economic model, and is in the spotlight as the environmental and social stresses continue to increase, leading to increased interest in circular solutions within the industry. Albania has shown for years an upward trend in the sector, having profitability due to the low costs of providing this service to foreign companies. Although with an increasing trend, Albania seems to be unprepared to apply the principles of the circular economy in the sector, mainly due to inefficient design and implementation of adequate policies. In this regard, this paper will shed light on the national legal framework, and on the need to establish a methodology for assessing the sustainability of these businesses, specifically on the Resource Efficient and Cleaner Production (RECP), as a continuous application of an integrated, preventive environmental strategy towards processes, products and services in order to increase overall efficiency and reduce damage and risks for humans and the environment. This approach, together with the Green Public Procurement efforts, can offer the sector an opportunity to apply the principles of the circular economy in the long term, as well as to increase competitiveness in the European market, which already has a high demand for sustainable methods of production and consumption.

Keywords: *Green Procurement, Circular Economy, Albania, Textile, Industry.*

Jel Code: H57, O13, P28, Q42

1. Introduction

The global economy depends on businesses stepping up in the face of global pressures with new forms of innovation and value creation. In this regard, the ‘circular’ economy offers a powerful way forward: a massive transformation from the traditional ‘linear’ ways of the economy to new principles of circularity (Lacy et al., 2020). The European Commission adopted the new circular economy action plan in 11 March 2022 whilst newness in this action plan was the demand for

additional measures to achieve a *full* circular economy (CE) by 2050. The EU strategy for sustainable and circular textiles was fully adopted in March 2022 (EC, 2022).

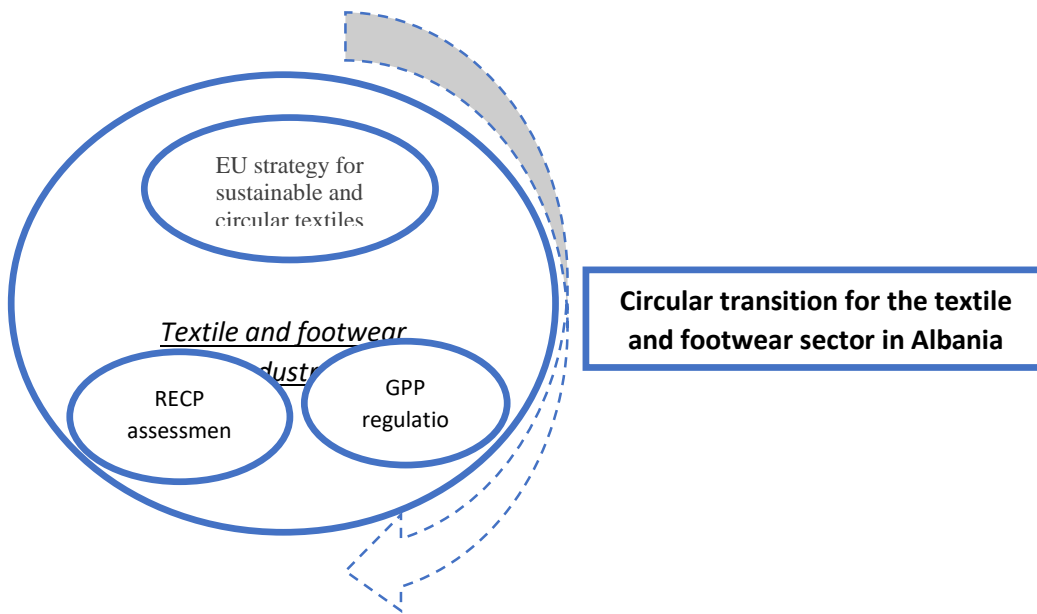
On the bright side, the EU accession goal provides impetus to leaving the wasteful linear economic model behind and shifting toward an implementation of circular economy (Heim et al., 2022). However, establishing a circular economy in the Western Balkans region, and specifically in Albanian case, finds itself in its initial stages. The progress achieved towards European membership is accompanied with implementation of sustainable development reforms in the Albanian economy. Alongside with EU accession goals, in September 2015 Albania, along with 192 other United Nations (UN) member states, committed to the implementation of ‘Transforming our world: the 2030 Agenda for Sustainable Development’ (United Nations, 2015; Köhler et al., 2021). Moreover, Albania has also signed in 2020 the Sofia declaration, aiming to achieve a full green transition (through the Green Deal), also in terms of circular economy approach following EU lead (EC, 2019; RCC, 2020). In this regard, Albania has pledged on working towards sustainability, specifically starting in her main economic sectors such as financial services, *textile, clothing, leather and footwear*, tourism and hospitality.

1.1. Aim and method used within the study

Within this paper, we will shift the focus on one of the biggest economic sectors, the textile, clothing, leather and footwear industry in Albania, which has currently *re-positioned itself to reflect market developments*. This sector is very important economically, as it has managed to improve the trade balance of Albania, and has reduced the market share occupied by imported ready to wear garment and footwear products.

The aim of this paper is to forge a path towards a Green Procurement Policy (GPP) and Resource Efficient and Cleaner Production (RECP) assessment tool for the textile and footwear sector in Albania, in order to soothe the sustainability goals and to facilitate the road toward circularity of the sector. The analytical method used within the paper is qualitative. The study analysis takes an interpretative approach, whilst reviewing secondary data available both nationally and internationally. The conceptual framework of the study is presented in the figure below.

Figure 1. Conceptual approach



Source: Author

2. Literature review

2.1. Circularity within the textile and footwear: current approach

The garment and footwear industry has to date one of the highest environmental footprints, while also largely contributing to increased risks for both human health and the environment (UNECE 2020; Musso et al., 2021). Environmental impact is largely linked to the fact that this industry involves a long and complicated supply chain, associated with the ever-rising consumption of water and energy, use of chemical substances, water and air pollution, waste production and finally micro plastic generation (Jacometti, 2019).

Circularity in the garment and footwear industry seems to enhance a path toward sustainability. Lately circular economy is trying and innovating, while radically transforming the conventional production systems into sustainable ways of production (Vercalsteren et al., 2019). Circular economy concept has the potential to deliver a dual relationship mechanism between the significant processes of industrial systems of the textile industry (Bukhari et al., 2018). Circularity in this sector can help utilize resources efficiently along with associated hazards (Coscieme et al., 2022). Circularity in this sector is not only beneficial for the environment. Applying circular principles within the sector can actually be very beneficial for garment and footwear companies, both upstream and downstream, as it allows them first and foremost to verify their sustainability claims, better manage their value chains, and leverage sustainability as a stronger source of competitive advantage in the national and international markets (Rinaldi et al., 2022).

However, this is not an easy process, as there are policy implications, necessary actions and recommendations to work towards achieving a fully circular and sustainable textile industry (Muthu, 2020; Abbas & Halog, 2021). The development of a long-term national program, with a systematic monitoring framework both environmentally and financially, could improve the current behaviour of overall industry both locally and globally (Alonso-Muñoz et al., 2022).

2.2. Albania case

Albania has shown for years a steady upward trend in the *textile, clothing, leather and footwear* sector. Before 1990, an important sector of the country's economy. After 1990, the production model changed, significantly changing the production technology as well (Shehi, n/a). The textile industry has expanded the map of cooperating countries, increased the volume of contracts and is now oriented towards closed-cycle production, accounting for about *38% of the total value of exports*. The number of companies operating in the textile sector, within the country, has increased every year, there are 827 (until 2021) active enterprises operating in textile, clothing, leather and footwear industry (UNIDO, 2022). According to INSTAT data, 804 enterprises of the textile, clothing, leather and footwear sector were registered in Albania in 2020. Out of these, about 700 are active companies. Out of the textile, clothing, leather and footwear sector enterprises, in 2020 there were 581 textile and clothing companies and 226 footwear and leather enterprises (INSTAT, 2021). The largest share of exports is Italy, followed by Greece, and the rest is divided between France, Bulgaria, Spain etc. With reference to national data, the main expenses in the in the textile, clothing, leather and footwear industry are those related to material and supplies needed to produce final goods that are shipped to end customers (UNIDO, 2022; INSTAT, 2021).

Moreover, is an important element to opening of EU negotiations, the alignment of the regulatory framework with EU one. The adoption of EU directives makes it easier for Albanian enterprises to export in the *Western and Northern European* that strongly support decent payment for workers, good working conditions and the implementation of *environmental measures* compared to countries like China or South Asia that are not obliged to do so (UNIDO, 2022). This is also due to a tax regulation between Albania and the European Union. There is no tax on temporarily exported materials when the same amount of materials is reimported into the European Union. To balance imports and exports, cutting waste must be declared at the customs. Even so, most of the companies today, do not apply waste recycling or/and separation.

Law No. 10440, dated on 07.07.2011 for "Environmental Impact Assessment", as well as in EU directive 2011/92/EU, states that the textile industry (only manufacturers for pretreatment, or for operations such as washing, bleaching, mercerization and/or fiber dyeing of textiles), are included in Appendix II were only a pre-screening is done. Only few of the companies currently operating in this industry, mainly operating in leather processing, or deal with the rinsing and dyeing of textiles, currently pass a basic check to obtain the operating permit²⁷. Different strategies also linked to the environmental footprint of the industry have been adopted in national terms, one of

²⁷ **Note:** There are two types of permits currently in Albania, type A and B, according to Law No. 52/2020 for some changes in law no. 10 448, dated 14.7.2011, "On environmental permits", amended.

which is the main regulatory act, the Decision of Council of Ministers No. 418, Date 27.05.2020 "*For the Approval of the Strategic Policy Document and National Plan for Integrated Waste Management 2020– 2035*". The strategic policy document sets out the need for a gradual transition from a linear to a circular economy, aiming among other things at life extension, collection through source separation and large-scale recycling. However, currently there is no law or regulation that quantifies these data, or measures the industry impact, meaning that no effort are in place in terms of circular strategies in the sector. However, this control of the use of resources as well as the environmental impacts that these specific companies have on the environment, still remains minimal, and insufficient to carry out in-depth analyzes of the impact of the sector, and consequently insufficient to design instruments to change the operation of companies from the linear to the circular method.

3. Discussion: Current needs and approach toward circularity in the sector

From the above analysis, we can see that in Albania, beyond the companies in the sector that have an immediate impact on the environment (such as leather processing or textile dyeing, contributing to large emissions in water and air), the rest of the companies do not pass a genuine ‘filter’ regarding the impacts they have and/or a roadmap towards circularity. Beyond the fact that Albania has taken legal initiatives regarding waste and its management within the circular economy policies, the achievement of these ambitious objectives is not met with the right instruments to do so. As a result, two very important issues are raised. First, can the regulatory legal framework of waste be applicable if the industry does not have a measurement unit that actually optimizes the process of the overall production in this sector? The fact that companies have to report how much waste they have produced to customs makes them formally or informally find ineffective methods to manage waste, such as paying companies on a monthly basis to eliminate their waste into landfills. This technique is not at all effective in terms of circular economy practices and it goes against the principles that the circular economy seeks to achieve. Second, the establishment of all these regulations and laws actually exerts economic pressure on companies, and instead of encouraging innovation and good management/optimization of the closed cycle of materials in the company, it actually has the opposite effect.

3.1. Resource Efficient and Cleaner Production (RECP) instrument

In this regard, we should put the emphases in the current national legal framework on Environmental Social and Governance (ESG) is used to identify good practices on SDG 8, 9, 12 in the textile, clothing, leather and footwear industry. This framework is used to measure, the sustainability impact of an investment in manufacturing enterprises and enterprises in operating in other sectors of the economy. This legal framework gives a hint on how we should address sustainability within the sector. Resource Efficient and Cleaner Production (RECP) is an innovative approach, specifically designed from United Nations Industrial Development Organization (UNIDO) and the United Nations Environment Programme (UNEP) (UNIDO, n/a), especially for Small to Medium enterprises for developing or countries in transition. The

implementing methodology for assessing the continuous sustainability of the sector (and/or EIA). This methodology is specially design to foster the three dimensions of sustainability, environment, social enhancement and heightened economic performance. Resource Efficient and Cleaner Production (RECP), is a tool for application of an integrated, preventive environmental strategy towards processes, products and services in order to increase overall efficiency and reduce damage and risks for humans and the environment and therefore increase the sustainability of the sector.

Figure 2. Resource Efficient and Cleaner Production (RECP) sustainability approach



Source: Authors elaboration, data extracted from: <https://www.unido.org/our-focus-safeguarding-environment-resource-efficient-and-low-carbon-industrial-production/resource-efficient-and-cleaner-production-recp>

Used effectively, RECP can help companies within the textile and footwear sector in Albania toward optimization of their processes and eventually forge their path toward optimization and circularity in their overall production process. Moreover, used as a measuring instrument within our legal regulatory framework, can help us identify the progress towards circularity. RECP monitoring assessment can help the sector to work in line with the Circular Economy principles, and furthermore, it can help the industry moving from a linear to a Circular Economy, turn waste into resources, empower consumers, cooperate, invest more and innovate more as well as try to use more low carbon technologies.

3.2. Green Public Procurement

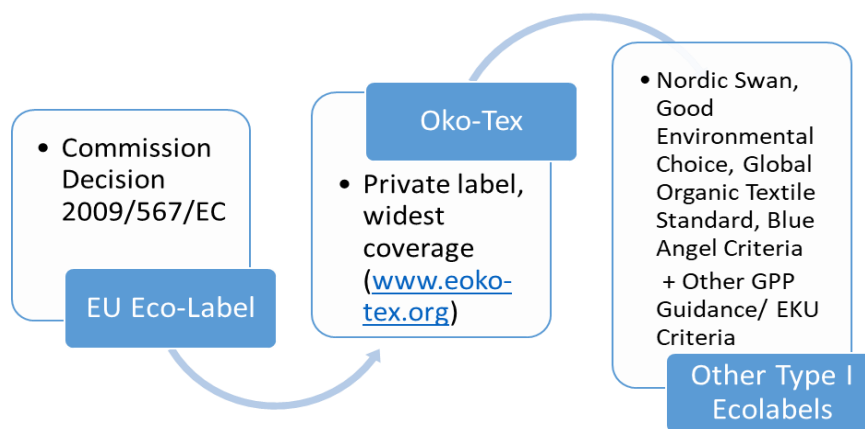
The sector currently faces a lot of pressure, especially in the approach of various investments, such as investments in energy efficiency through the installation of panels or the optimization of waste by introducing new innovative technologies, etc. This puts a lot of additional costs in the industry. And somehow the opportunities for doing so are not much visible to them. In this regard, Green Public Procurement efforts, can offer the sector an opportunity to apply the principles of the

circular economy in the long term, as well as to increase competitiveness in the European market, which already has a high demand for sustainable methods of production and consumption.

More than half tenderers from European Union (EU) who have their products made - often very cheaply - outside EU, much example goes in Albania who currently does not have a GPP policy. (EC, 2011). This is actually a great opportunity for the sector, as if the sector applied the RECP approach and goes toward sustainability and circular processes in terms of production, GPP certification and patenting as an eco-product, can make the sector grow stronger and expand in term of economic prospects. This is not an easy process though, as core criteria products meeting the requirements of EU Ecolabel for textiles have many specifications.

Additionally, award criteria have been included relating to the use of organically produced cotton and recycled fibers. The Comprehensive criteria include production process and fiber-specific criteria taken from the requirements under the EU Ecolabel in the specifications, with the use of organically produced cotton, recycled fibers being encouraged in the award phase. Moreover, there are fitness for use criteria, which specify minimum requirements for color fastness and dimensional stability. These should be verified with test results (EC, 2011). Below is a figure showing the main eco-labels and standards.

Figure 3. Existing Standards, Ecolabels and other criteria sources



Source: Authors elaboration, data extracted from: https://ec.europa.eu/environment/gpp/pdf/tbr/textiles_tbr.pdf

However, RECP instrument, is a core measure, which can help this companies during the screening process, this because the RECP method performs a preliminary control of flows, types of materials, as well as the end of their cycle. Passing the control of RECP actually halves the work of companies to get an ecolabel. In addition, RECP methodology can help the companies with additional preliminary controls such as fertilizers and pesticides, substances used in the processing of textiles, water and energy use and the amount of recycled fibers.

Furthermore, GPP offers a new market, and should be used as incentive even nationally. Public institutions should during the opening of tenders for uniforms or for other public needs, they should look for companies that meet the GPP criteria, which will increase the competition with other countries as well as the competition of the sector. The increase in competition will consequently translate into more innovation and increased investment for the textile and footwear sector in Albania. Albania should adapt the GPP policies and instruments as soon as possible in order to increase competitiveness in the European market (Jabłońska et al., 2022). Not doing so, Albania can start to lose its most important exporter, and lose it as a market. An example is Germany, one of the largest exporters in the industry until 2020, holding the second place in exports, meanwhile it is no longer on the list even of the smallest ones.

4. Conclusions and recommendations

In the current Albanian law, there is no systematic evaluation in terms of sustainability for the textile and footwear sector. The law provides for this type of sector only the category of permit to which it belongs, and a preliminary environmental review to obtain this permit (type A or B permits), or a preliminary Environmental Impact Assessment (EIA), is done only in the first phase when the company is about to open. However, the current legal framework and assessment tools are not enough to incentive the sector toward circular economy approach. In this regard, this paper presented RECP as a methodology that can be applied at any stage, within the framework of the sector's modification to increase their sustainability and work within the framework of circular economy principles. The systematic evaluation through RECP can make the sector become sustainable by 2030, systematically, and within the working principles of the Circular Economy. In addition is worth mentioning that Albania's primary exporter is European Union. Within the framework of Agenda 2030, Europe is now introducing Green Public Procurement as an instrument for the textile sector, which implies that very soon it will have and will increase the competition of industries outside Europe that produce with circular economy methods. Therefore, the paper recommended that together with RECP assessment method, Albania should adapt the GPP policies and instruments as soon as possible in order to increase competitiveness in the European market.

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Fintech: The economic and social impact in Albanian context

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Abstract

In a world that is changing and being driven more and more by technology, the banking system is directly and indirectly impacted. FinTech is not a new terminology, but nowadays it is getting more attention. For the first time as a terminology, it was used in 1866, and regardless of the existence of several definitions, it means the use of technology for the improvement of financial services. The main purpose of this paper is to review the existing literature and bring statistical data to analyze its usefulness in economic and social terms. The main focus will be placed on the connection of Fintech with the banking system in Albania, including the use of crypto currencies as innovation in payment system too. The methodology used in this paper includes the qualitative and quantitative analysis of the main indicators of the banking sector, focusing mainly on identifying the impact of Fintech. In addition to the theoretical treatment mainly based on foreign literature, an in-depth analysis of the system is carried out in which the impact of technology is identified. One of the main limitations of this paper has to do with a reduced base of existing literature (almost non-existent for Albania). This paper summarizes all theoretical and statistical findings, which are evaluated and correlated with the impact of Fintech.

Keywords: Fintech, crypto currencies, banking.

Jel Code: G21

Introduction

The more general concept of “financial technology,” or FinTech, includes any technological innovation in the financial sector: retail banking, investment as well as innovations in financial literacy and education or crypto-currencies (Thakor, 2019). In other words, Fintech means the use of technology to offer new and improved financial services.

According to Ernst & Young (2019) FinTech is defined as organizations that combine innovative business models and technology to enable, enhance and disrupt financial services.

The FSB defines FinTech as “technology-enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on the provision of financial services”.

The areas covered by Fintech can be classified in different ways, but in the most widespread and broad case, they can be grouped as follows: transaction execution, funds management and insurance (Thakor, 2019). Part of the technological backbone of fintech is the Blockchain technology, which aims to achieve economies of scale, reduce search costs and verification costs and achieve secured information transmission with lower cost.

There are three phases of Fintech development:

Phase I (1866 – 1967) - This period is known for the introduction of the telegraph and the successful laying of the first transatlantic cable. After the second world war, technological development took a bigger leap especially in the field of information technology, a period which was accompanied by the introduction of the Automatic Teller Machine, which created the appropriate convenience for customers, avoiding physical visits to the bank.

Phase II (1967 – 2008) - This period was characterized by transactions in electronic form between financial institutions, financial market participants and different clients. Traditional financial institutions increased investments in information technology, offering also the possibility of performing online banking services. In 2005, the first direct banks were created, offering services without physical branches (ING Direct, HSBC Direct).

Phase III (2008 – ongoing) - During this period, new companies in the field of technology began to offer products and financial services directly to businesses and the general public. These companies led to increased competition in the provision of financial products and services, which were previously offered mainly by financial institutions.

The main aim of this paper is to review the existing literature on the impact that Fintech has in economic and social terms and to bring statistical data and analysis in the Albanian context. The main focus will be placed on the connection of Fintech with the banking system in Albania, including the use of crypto currencies as innovation in payment system. The paper is organized as follows: the following section summarizes the literature review; in the second section we explain the methodology, which is followed by the analysis and interpretation of findings. The last section includes the suggestions for further studies.

1. Literature review

Eventhough it is a new development in the field of finance, Fintech has brought several benefits to customers, public and private institutions and has improved the economic development. Fintech can influence the growth of the country's gross domestic product, providing access to more financial products and services, as well as credit facilities for both individuals and businesses. Such a thing is expected to bring an increase in aggregate demand and, consequently, an increase in the economy. According to Manyika and others (2016), GDP can be increased by 6% in developing countries, if two goals are met: digital payments should be increased from 25-50% during the next 10 years and at least 91% of adults in the country should have access to financial services. This conclusion was supported also by the study conducted by Song and Appiah Otoo (2022), who used data for a period of 7 years (from 2011 to 2017). The study concluded that the growth of fintech by 10% can affect the economic growth of China by 8%.

Consumers International (2017) confirmed that Fintech plays an important role in increasing competition, improving alternatives for delivery of financial services, as well as providing them at a lower cost. More specifically, Philippon (2015) in his study estimated that the unit cost of financial intermediation in the USA has remained unchanged during the last 130 years (2%). One of the main benefits of Fintech is the provision of financial services at a lower cost. Moreover, Fintech offers the opportunity to make and receive payments in a very short time. This leads to efficiency for consumers, saving them the time it takes to go to the bank and the time spent waiting for the service to be performed.

The development of innovation can bring the increase in the performance of financial and non-financial economic entities, mainly banks. Scott et al. (2017) studied how the adaptation of SWIFT affected the profitability of banks. The data of 6848 banks operating in 29 countries in Europe and America were used and the results of the study show that the adaptation of SWIFT has a significant impact on the profitability of banks in the long term and the greatest positive effect is observed more in small banks than in large banks.

The electronic execution of transactions leads to reduction of the level of informality. This means that the transfer of monetary funds is done officially and it makes it easier to carry out verifications by state institutions and therefore it is expected to influence the increase of the budget revenues collected by the state. On the other hand, this kind of payment reduces the use of physical money in economy, resulting in decrease of circulation of fake money. Thus, Fintech is advantageous for financial and supervisory and regulatory institutions. Another benefit offered by Fintech is the fact that it plays an important role in increasing access to basic financial services in countries where consumers have not had the opportunity to receive such services (Consumers International, 2017).

Despite all the above mentioned studies that support the development of Fintech, there are also other studies which provide evidence on many problems that Fintech may cause. The first and most discussed issue is the protection of customer data. This is especially important nowadays when there is a high risk of cyber-attacks. According to the report of World Bank (2020) this is a concern for both start-ups and large companies that deal with sensitive consumer data. On the other side, digital data security breaches can reduce customer trust and general use of digital finance platforms in the future.

As mentioned before, Fintech brings some advantages to the regulatory and supervisory institutions. But, at the same time, there is some risk also for these institutions which may not have the capacity to monitor and address all issues related to Fintech due to the fact that in some cases they fall outside of their applicable framework.

The use of technology is considered as complex in some cases and there are some Fintech financial services that cannot be used by everyone. Many individuals still do not have the necessary means to access these financial services.

According to Albania, there is still little evidence and lack of official data on the status or use of Fintech. The World Bank (2020) identifies the main obstacles for the its development, which include: lack of financing sources and capital, lack of a clear FinTech strategy by regulators and policy makers, underdeveloped ICT infrastructure in several cities of the country and emigration of local talent.

2. Methodology

The main part of the paper, especially the descriptive analysis, or the theoretical treatment of Fintech, is based on the deductive method. According to the deductive method, we start from the general to move to a specific or special case. The methodology used in this paper includes the qualitative and quantitative analysis of the main indicators of the technological sector, focusing mainly on the indicators of Fintech products. The sources used for the data are several, among the most important we can mention: Instat, the official websites of banks in Albania, QKB. The data mainly consider the period from 2017 to 2021.

The paper presents an analysis to accurately specify the definition of Fintech and then to identify some factors, for which vertical and horizontal analysis of indicators is mainly used. After familiarizing ourselves with the picture and after using the literature to identify the concept on which we will work, we dedicate a separate section to a descriptive analysis of them, based on the

specific data of a certain bank. In order for the reasoning to be more complete and the facts to be "justified", we have woven into this descriptive analysis and general indicators of the technological sector. The descriptive or narrative method helps to provide a theoretical overview of the field of study. In this paper, this method constitutes exactly this advantage. Combined with comparative instruments, it makes it possible for the information to be structured in such a way as to provide what is expected from the work. So, these methods help and are valuable, precisely to lay out the theoretical aspect and to make a clean and accurate representation of the theoretical framework and not only.

In this paper, a detailed analysis is made of fintech products in our banking system, thus highlighting innovations in this market. At this point, it is worth mentioning the limitations of this work. due to the productive breadth or terminology that accompanies Fintech, but also due to the lack of a rich literature related to this concept, it has been quite difficult to carry out a complex literature review. Also, in the data published in Albania, there is always talk about technological innovation, or the technological sector, but there is a lack of detailed information at the Fintech level.

3. Analysis, Findings, and Interpretations

3.1 General analysis

The development of Fintech has been very dynamic, especially in the last 5 years. And in Albania, the banking sector has started to offer fintech products, as a range to adapt to an ever-changing world. In Table 1, we look at the situation of Fintech companies in the world, before moving on to see the current situation in Albania.

Table 3: The Fintech number of companies

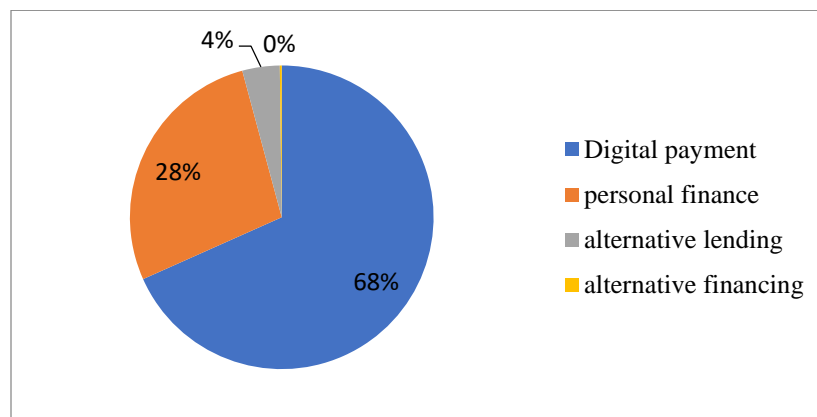
Year	America	EMEA	APAC
2018	5686	3581	2864
2019	5779	3583	2849
2020	8775	7385	4765
2021	10755	9323	6268

Source: Statista Research Department (2022)

The largest number of Fintech companies is in America, where, according to the literature, they have a developed legislation for the regulation of Fintech companies. Also, most of the studies are focused mainly on American countries. From the data we can see also that in the last 4 years, the number of Fintech companies has almost doubled in Amerika and tripled in EMEA and APAC. From 2021 to 2020 and 2020 compared to 2019, regardless of the pandemic situation, which was accompanied by the closure of many companies, the number of fintech companies in total has increased by 26% and 71%, respectively. Based on the literature, the pandemic brought a need for the banking sector to adapt to the situation and to offer as many online services as possible. Precisely the solutions were offered by Fintech companies.

But what is the value of this market according to the main segments? In Figure 1 below it is obvious that the biggest weight in this market is related to Digital payment. This is because it is the most integrated product in almost every bank in the secondary sector.

Figure 9: Value of the Market



Source: Statista Research Department (2022)

To study the impact of technology in Albania, in Table 2 there is a summary of the situation of technological companies over the years (as mentioned in the limitations of the topic, there is no data that can identify only companies profiled in the provision of products/services Fintech).

Table 4: Number of tech companies in Albania

Year	Group by the number of employed				Total
	1-4	5-9	10-49	50+	
2017	2,519	206	161	41	2,927
2018	2,523	212	196	43	2,974

2019	2,554	267	213	55	3,089
2020	2,858	216	220	55	3,349
2021	3,401	248	282	74	4,005

Source: INSTAT (2022)

What is noticed is that in Albania the growth rates of technological companies are lower. From 2020 to 2019, they increased by 8%, while from 2021 to 2020, by 20%. Remote work in this industry can be identified as one of the factors (the identification of factors will be a matter of another paperwork), since after the pandemic the employees of this industry do not have any barrier restrictions. Now in Albania, the largest number is occupied by small technological companies with a maximum of 4 employees, but from 2021 to 2020, the largest increase of 35% was achieved by companies with more than 50 employees, followed by companies with 10-49 employees.

The most reduced group in the last two years is the one with 5-9 employees. An explanation (which should be accompanied by a more complete research) can also be found in the fact that these companies have experienced an increase in staff and a change in status (because in 2021 and the same situation is being observed in 2022, the technological companies have significantly increased their staff, to cope with projects postponed during the pandemic period).

3.2 Case study

To enrich the topic with a concrete case that can give a picture of the integration of Fintech in the banking sector in Albania, we specifically chose the BKT bank because in 2021 it won the award as the most innovative bank. During the year 2021, this bank has offered many new products, but also technologically improved some of the existing services/products (BKT, 2022).

SmartInvest: Due to the specifics of Albania, where there is no functional stock market, investment opportunities are reduced. For this reason, BKT has created an app that allows different investors to create an investment portfolio on a secure platform.

SmartPay&Smart Insurance: Based on an increasing number of users of the mobile application, it has introduced a payment method through QR, so that users can make the payment of obligations in an automated way as easy as possible. The same option is offered for insurance policy payments.

Smart Bankomat /CRM logic: It offers personalized views of ATMs and CRM depending on the individual logged in (so that the offering of products is as personalized as possible).

Based on Thakor (2019), the integration of Fintech in the provision of products and services should be accompanied by a reduction in service costs, but also by a reduction in income from fees in the banking sector. For this reason, we have analyzed the change of these indicators for BKT bank from 2020-2021. Unfortunately, the comparison with 2020 and 2019 does not serve as a very

effective basis for comparison, because artificially due to the pandemic, operating expenses and income from fees have been more reduced than under normal operating conditions (many of the branch's banks are closed during that period).

Table 5: BKT overview

Items	Albania 2021	Albania 2020	Differences
Fees and commission	19.839.345	15.544.812	0.276267928
Personnel expenses	19.002.207	16.596.290	0.144967158
Administrative expenses	32.861.866	27.459.658	0.19673253

Source: BKT (2022)

Table 6: Income from fees

Fees	30.06.2022	31.03.2022	31.12.2021	30.09.2021	30.06.2021	Differences
From treasury and interbank actions	222,704	277,703	261,534	240,436	218,437	-0.246960091
From transactions with customers	746,146	338,607	1,485,440	1,093,699	634,100	0.546192032
Commissions for banking services	767,386	343,558	1,386,203	1,006,089	656,082	0.552300928
Other	7,236	3,763	11,987	9,105	5,990	0.479961305

Source: BKT (2022)

Table 5: Expenses

Expenses	30.06.2022	31.03.2022	31.12.2021	30.09.2021	30.06.2021	Differences
From treasury and interbank actions	(44,147)	(22,890)	(51,217)	(44,376)	(32,147)	0.928658803

From transactions with customers	(248)	(119)	(303)	(181)	(79)	1.084033613
Commissions for banking services	(12,478)	(7,416)	(23,080)	(16,164)	(10,671)	0.682578209

Source: BKT (2022)

In Table 3, we can see that regardless of the integration of Fintech, the income from fees in 2021 compared to 2020 has increased by about 27%, significantly more than the increase in operating expenses. In table 4, we can see a 3-month comparative table and for the year 2022, also detailed. In fact, in 2022 we have an increasing trend, where Commissions for banking services have the highest growth. What is noticed in the second 3 months of 2022, is that the rates of growth of operating expenses are higher than the rates of growth of income from fees. From transactions with customers has the highest growth rate, suggesting that BKT customers continue to carry out physical transactions in bank branches. At this point, it is necessary to study the average age of the customers of this bank and to do a qualitative analysis to understand the preferences of consumers. Perhaps an informative campaign would be of added value.

These results are not surprising since the analysis carried out in America (Thakor 2019) where Fintech is more developed and regulated, the theory is not in line with the practical results. So, a positive correlation between Fintech and the impact on transaction fees has not yet been proven.

4. Suggestions for Further Studies

A detailed analysis of the efficiency of Fintech in our country. It is necessary to involve more banks so that the results are as inclusive as possible. It would also be an added value to carry out a questionnaire to understand the perception of customers regarding the technological innovations offered.

Will have P2P effects on the performance of our banking system. At the moment in Albania, it has not yet started to be recognized as a form of service. It would be more valuable to understand the efficiency and impact it can have on our market (due to the specifics that the banking and investment market has)

Are Albanian consumers ready to use automatic payment products? This question can be integrated as part of the study of the efficiency of digital payment in Albania.

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A systematic review of synthetic data generation methods

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Abstract

Data is the crucial fuel that drives advanced analytics and machine learning activities within enterprises; but, due to privacy concerns and challenges with processes, it is not always easy for researchers to get their hands on what they require. Synthetic data is a potential new direction to investigate since it can be shared and used in ways that real-world data cannot be used. Nevertheless, this novel strategy does not come devoid of potential hazards or drawbacks; hence, it is vital for businesses to carefully investigate where and how they invest their resources.

Although the concept of synthetic data has been around for some time, we are rapidly nearing a pivotal juncture in terms of its potential impact in the actual world. It has the potential to completely disrupt the value chain as well as the technology stack for artificial intelligence, which will have significant repercussions for the economy.

In this paper, we discuss the topic of synthetic data, with a broad explanation of their applications, metrics, methodologies, and drawbacks. Considering the attentions that industry is showing towards these techniques not fully invested in in the Balkan area, the goal of this paper is to instill scientific interest to practitioners and researchers in the region.

Keywords: Synthetic data, Information Security, Privacy, Machine Learning, Artificial Intelligence, Computer Vision

Jel Code: C69, C80, C88, C89

Introduction

Motivation

If we suppose for a moment that it were feasible to manufacture limitless quantities of the most precious resource in a manner that was both efficient and economical. What kind of profound economic shifts and new opportunities might emerge consequently? This type of data is known as synthetic data. The modern economy cannot function without data as its pillar. Within just a few short years, most of the data that is utilized for emerging data management technologies – Artificial Intelligence; Machine Learning; Big Data - may come from a disruptive new source, that very few businesses understand or even know about. The collection of accurate data from the "real world"

is a challenging task that is often time-consuming and expensive. Here is when the use of synthetic data comes into play. According to a study conducted by Gartner [2], by the year 2024, synthetic data would account for sixty percent of all data that is utilized in the creation of artificial intelligence. In fact, AI is on the verge of being revolutionized by synthetic data.

Synthetic data is generated by a model that is trained to reproduce the characteristics and structure of the original data. This indicates that original data and synthetic data, when subjected to the same statistical analysis, should produce results that are substantially comparable to one another. By modeling an existing data set's probability distribution and then sampling from it, the objective is to mimic the statistical traits and patterns of the data set in question. The algorithm, in its most basic form, generates new data that contains all of the same features as the original data, which ultimately results in the same responses. The notion of synthetic data is one of those notions that is of straightforward nature. Their technologies give practitioners the ability to simply and digitally generate the data that they need, whenever they need it, in whatever volume they need it, and customized to their exact needs.

The technique may find applications in a variety of different fields, specifically for users' privacy. E.g., companies in the financial services industry are beginning to use synthetic data to help them identify and eliminate partiality in how they treat customers. This allows the companies to do so without violating data privacy regulations, which are particularly restrictive in the context of data usage and customer privacy.

And recently, computer vision has been shown to have a wide range of useful applications throughout the economy. Some of these applications include robotics, physical security, geospatial images, and manufacturing. In addition, to construct models for any of these application cases, huge amounts of annotated image data are required. The use of synthetic data is an effective approach in this situation.

State-of-the-art

Generative Adversarial Networks (GANs), since their invention in 2014 [3], lie at the core of synthetic data. The most conceptual advance was to build GANs with two independent neural networks and then compete them against one another. In this scenario, one could generate thousands of synthetic images, that might be useful the Computer Vision as a field of study. Specifically, the first neural network, which is referred to as the "generator," begins the process of creating new images by starting with a dataset (for example, a collection of photographs of human faces). These new images are mathematically similar to the existing images in terms of the pixels that they contain. During this time, a second neural network, referred to as the "discriminator," is being fed photographs without being notified whether they are from the initial dataset or from the output of the generator. The discriminator's job is to determine which photos have been generated artificially. As the two networks continue to compete against one another in an iterative manner — the generator attempting to deceive the discriminator, and the discriminator attempting to identify the inventions of the generator — they hone the capabilities of one another. The success rate of the discriminator's categorization attempts eventually drops to 50%, which is no better than

guessing at random. This indicates that the synthetically generated photographs are now indistinguishable from the originals. Similarly, to photographs, GANs are used to generate synthetic passwords, as in [1]

Diffusion models and neural radiance fields are two more significant scientific advancements that have been generating current momentum in the field of visual synthetic data (NeRF) [1].

Datagen [20], and Synthesis AI [21] are two companies offering computer vision solutions based on synthetic data. Both businesses focus on human data, and in particular human faces; the platforms they provide enable customers to programmatically change facial information across dimensions such as head postures, facial expressions, ethnicities, gaze orientations, and hair styles. Another successful example of synthetic data is in the simulation technology, specifically, autonomous vehicles. They were the original stimulus for the growth of synthetic data some years ago. To this day, the autonomous vehicle sector continues to push ahead the state of the art in the industry, which brings us full circle.

Another area where synthetic data is starting to unleash another revolution is language [4]. In fact, the rapid developments that have been made in natural language processing (NLP) [5] in recent years are creating great possibilities for the production of value across all sectors of the economy. The use of synthetic data is quite important in this context. Utilizing large language models (LLMs) [6] to generate unstructured text (or multimodal) data corpuses of previously imagined levels of realism, originality, sophistication, and diversity presents a potential for the development of next-generation synthetic data technology.

Finally, synthetic data applications are becoming very important in information security, such as fraud detection. In preserving privacy, they are included in the anonymization processes of patients in healthcare [7]. Actual models that process these data, are trained on actual patient data, which might raise privacy concerns. But these concerns are eliminated when the data used in these models is fabricated. In biometric systems, [22] has included synthetic biometric templates in face verification, as an additive security layer.

Methods and metrics

Within the realm of machine learning, the use of synthetic data is becoming increasingly popular [8]. It is helpful for training machine learning algorithms that require a massive amount of labeled training data, which can be expensive or come with constraints on how the data can be used. In addition, researchers have the option of utilizing synthetic data for the purpose of quality control and software testing. They can also benefit from using synthetic data to develop data repositories that are required for training machine learning models. Measures of global utility can be used to determine the overall usefulness of a synthetic dataset. The concept that underpins these metrics is that they should provide insight into the differences in the distributions of the original dataset and the published dataset, with greater usefulness being assigned to synthetic data that are more comparable to the original data.

Metrics of distinguishability are well-known examples of global utility measurements. They provide a description of the degree to which it is possible to differentiate the primary dataset from the one that was synthesized. The propensity score [9] is the distinguishability metric that has received the greatest attention. A propensity score is a numerical representation of the likelihood of record membership (original or synthetic). It requires the creation of a classification model in order to differentiate between the real dataset records and the released dataset records.

The propensity score might range anywhere from 0 to 0.25, with 0 suggesting that there is absolutely no way to differentiate between the two datasets. This might occur if the generator overfits the primary dataset and produces a synthetic that is indistinguishable from the primary dataset. On the other hand, if it is possible to clearly differentiate between the two datasets, the propensity score would be one for the synthetic rows and zero for the original rows. It is said that the Propensity score is the best realistic metric for forecasting the overall utility of a synthetic dataset, and it is also seen to be useful for comparing various synthesis methods [9].

It is commonly held that free societies cannot exist without privacy and confidentiality (Westin 1968, Cohen 2012). Threats to the data privacy of individuals are becoming increasingly prevalent as large-scale data collecting becomes more commonplace from attackers or other threatening agents. In spite of these dangers, a significant number of statisticians and other consumers of data have a limited awareness of what data privacy is and how it affects our work. However, statistical outputs (such as summary statistics and parameter estimates) pose threats to individual disclosure, just as their inputs do through access to confidential databases; this makes the issue of data privacy a methodological problem that goes beyond the known failures of anonymization alone.

2.1. Statistical methods

There are many different types of statistics, and not all of them reveal the same information about individuals. One of the most important applications of statistics is in the process of negotiating the appropriate balance between privacy and benefit (through uncertainty quantification). Statistical data privacy (SDP) aims to develop a data privacy theory and methodology that is both provable and usable. This will be accomplished by integrating tools from the fields of computer science and statistics. This will allow for the broad sharing of data across many different data contexts and domains where it is desired or required that individual identities or sensitive attributes be protected. Some examples of these contexts and domains include the census, health, genomic data, and social networks. In order to be able to enable correct inferences, SDP approaches need to reduce the danger of sensitive information being disclosed or losing its privacy while at the same time preserving a significant amount of the data's statistical integrity (i.e., maximize data utility).

Two dominant frameworks in SDP, defined by different units of analysis, make different conceptual trade-offs regarding adversarial assumptions, disclosure risks, or privacy definitions, and their effects on downstream inference. These conceptual trade-offs can be thought of as giving up some privacy in exchange for a greater degree of security. Statistical disclosure control (SDC) [10] or Statistical disclosure limitation (SDL) methods [11] typically analyze individual databases, whereas differential privacy (DP) methods [12] analyze pairs of databases in a shared schema.

Different methods imply that it is common practice to generate synthetic data from the original raw data because it is a widely held belief that data must be modeled in its original form, before the application of any transformations. Synthetic data can also be generated from processed data, but this is less common. However, despite the fact that this sounds like a plausible assumption, it has not been tested empirically on actual data.

In point of fact, there are no advice regarding the optimal way to utilize the created synthetic data in real life settings, nor do any exist regarding the optimal way to select the various parameters of machine learning models. In conclusion, when contrasting the various data synthesis techniques, several data utility measures are applied throughout the many pieces of published research. There is not a single process or measure that is universally accepted for determining the value of synthetic data; rather, numerous measures have been created and put to use within the research community, with a focus on classification accuracy and propensity score.

Economic and societal advantages of synthetic data

As researchers benefit much from using synthetic data, let us bring as an example the work that the National Institutes of Health in the United States is conducting [23]. They are using a synthetic data engine to produce and validate a nonidentifiable replica of the NIH's database of COVID-19 patient records. This database includes more than 2.7 million individuals who have been screened and more than 413,000 patients who have tested positive for COVID-19. The synthetic data set, which exactly duplicates the statistical properties of the original data set but does not contain any links to the original information, can be shared and used by researchers from all over the world to learn more about the disease and to accelerate progress in the development of treatments and vaccines.

Mainly, utilizing the data protection-by-design methodology [13], this technology may be able to offer, following the completion of a privacy assurance assessment, an additional value for the privacy of individuals, whose personal data is not required to be disclosed. In fact, this is considered as the most obvious advantage of using synthetic data, as it reduces the risk of compromising the privacy and security of both businesses and their consumers. Techniques such as encryption [14], anonymization [15], and advanced privacy preservation [16] (for example, homomorphic encryption [17] or secure multiparty computation [18]) are centered on the goal of protecting the original data as well as the information that the data contains that could potentially be used to track down an individual. However, so long as the original data is in circulation, there will always be the possibility that it will be corrupted or exposed in some fashion.

Synthetic data enables enterprises to more quickly acquire access to data. Take, for example, a financial institution that possessed a treasure trove of valuable data that was capable of assisting decision-makers in resolving a wide range of operational issues. Even for the purposes of strictly internal usage, acquiring access to the data was a difficult task because it was so well safeguarded. In one instance, it took six months to collect a relatively little quantity of data, then it took another six months to get an update on that data. Now that the company is generating synthetic data based

on the original data, the team is able to continuously update and model it, as well as generate continuing insights into how to improve business performance.

As cybersecurity is considered nowadays by many governments as one of the main drive for a stable economy, a recent discussion on the future of privacy held in 2020 [19], named synthetic data generation as one of the most important technologies that will improve privacy in the next decade. In fact, research in the field of synthetic data is growing in two primary directions: in creating new mechanisms for the generation of synthetic data, while others are investigating the effectiveness of such generators in real-life scenarios. Another strategy for addressing privacy legislations [is known as anonymization, which is defined as "a technique to prevent identification taking into account all the means reasonably likely to be used to identify a natural person". Secondly, sanitization of information results in the production of data that cannot be traced back to the individuals who provided it in the first place.

It is expected that synthetic data will have a disruptive impact across a variety of businesses in the coming months and years as it becomes increasingly prevalent. The economics of data will be completely upended as a result. Synthetic data will undermine the value of proprietary data assets as a long-term competitive advantage by making high-quality training data significantly more available and more affordable. Throughout the course of business, regardless of the sector, the first and most essential question to ask in order to comprehend the strategic dynamics and opportunities presented by AI has always been, "Who owns the data?" One of the primary reasons that digital giants such as Google, Facebook, and Amazon have been able to attain such a dominant market position in recent years is because of the unparalleled volumes of customer data that they possess. This will alter as a result of synthetic data. It will help level the playing field by democratizing access to data at scale, which will enable smaller upstarts to compete with more established players that they otherwise may not have had a chance of contesting.

4. Reasons for a slow expansion

Although the advantages of using synthetic data are apparent, taking advantage of them can be challenging. To successfully generate synthetic data, an organization has to do more than use an AI tool to evaluate its data sets. This is because generating synthetic data is an exceedingly complicated process. For these data to be accurately generated, you will need individuals that have particular expertise as well as advanced knowledge of Machine Learning. A corporation also needs extremely particular and complex frameworks and measurements that enable it to validate that it generated what it set out to build in order for the results to be sound. This is the point at which things become exceptionally difficult. Certain activities (like prediction or statistical analysis [19]) call for the use of particular kinds of synthetic data, and these types come with their own unique sets of performance indicators, needs, and privacy constraints. In addition, the various modalities of data each prescribe their own necessities and difficulties.

Secondly, it is essential that the authenticity of the synthetic data be demonstrated, and that the artificial data it developed accurately replicates the primary data set. Furthermore, the artificial data must not be connected to or exposed in any way to the primary data set. That is not an easy

thing to accomplish. If it does not match exactly, then the synthetic data set is not genuinely authentic, which opens the door to a whole range of possible difficulties.

Thirdly, regulators can also be a risk for a corporation that creates inaccurate synthetic data. If the use of such data leads to a compliance or legal issue. One example of this scenario is the creation of a product that didn't work as advertised or caused harm to someone. Regulators have just started investigating how synthetic data is produced and measured, not to mention how it is distributed; definitely, they will have a part to play in guiding this activity.

Fourthly, the risk of member inference attacks is a far-reaching consequence of badly constructed synthetic data, but it is nonetheless a real one. The idea behind synthetic data is that it is not connected to the real-world data in any manner, shape, or form. However, if it isn't produced properly, malevolent actors could be able to uncover a flaw in it that allows them to track a data point all the way back to the original data set and deduce who a certain individual is. The actors can then utilize this knowledge to persistently probe and question the synthetic set, and eventually figure out the remainder, so revealing the whole original data set. Other challenges include:

Bias: is something that can easily enter into AI models that have been trained on data sets that contain inherent prejudices that have developed over time.

Controlling the output: the most effective method for ensuring that the output is accurate and consistent is to compare synthetic data with genuine data or data that has been annotated by humans, i.e., access to the primary data is necessary once more.

outliers mapping: it's possible that synthetic data won't cover some of the outliers that the actual data does.

the data source: the quality of synthetic data has a strong relationship with both the quality of the original data and the quality of the model used to generate the data. There is a possibility that synthetic data will mirror the biases present in the original data.

Recommendations

In the future years, we will hear significantly more about synthetic data due to the maturation of the relevant skills, frameworks, measurements, and technologies. Research and Development should consider the answers to the following four questions when determining whether or not it makes sense for them: (a) do the appropriate persons have an understanding of what we are getting ourselves into? (b) do we have access to the appropriate capabilities? (c) do we have a clear goal that is crystal?

The advent of synthetic data will have the net effect of empowering a whole new generation of AI upstarts and unleashing a wave of AI innovation by decreasing the data barriers to constructing AI-first solutions. This will be the case because synthetic data will cut the cost of gathering data. Because synthetically generated data does not require manual labeling, this is an interesting impact that is related to the growth of synthetic data. It will have the effect of reducing the necessity for data labeling as well as the importance of doing so.

The process of data labeling has always considered a clumsy and unattractive component of modern machine learning pipelines. Intuitively, really intelligent agents, such as humans, should not require labels to be manually added to everything they perceive in order to be able to recognize those objects. In the years to come, synthetic data technology will completely transform the field of artificial intelligence, causing disruptions in competitive landscapes and redefining technological stacks. By making it easier for more people to access data, it will catalyze the rapid diffusion of AI throughout society. It will play a critical role in accelerating the development of AI in the future. Those persons, groups, and organizations that are familiar with data should pay attention.

Conclusions

The generation of synthetic data is not an endeavor for the faint of heart. Because of the sheer intricacy involved in doing it correctly and the possible risks involved in doing it incorrectly, companies need to ensure that it will provide a substantial amount of value in return before investing in it. Even while synthetic data is still at the forefront of data science, an increasing number of businesses are exploring ways to take it out of the lab and apply it to problems that are encountered in the real world of business. It is currently unknown how this evolution will play out or what timetable it will adhere to. However, leaders of data-driven businesses should keep it in mind and be prepared to weigh the pros and drawbacks of implementing it when the moment is opportune for them to do so.

Both the SDC and the DP are schools of thought that present the fundamental issues with data privacy from distinctive perspectives; both the theoretical and empirical benefits and drawbacks of each approach are discussed here. Moreover, choosing to frame data privacy concerns from one perspective rather than the other creates trade-offs that cannot always be quantitatively recorded; these may be best answered by the legal and normative literatures on data privacy.

Even though we have focused on data privacy in a specific, technical sense, privacy is inherently an interdisciplinary topic that involves philosophical, legal, and political scholarly traditions. Even though we have focused on data privacy in this way, privacy is a naturally interdisciplinary topic. The legal operationalization of SDP is still a challenge that has to be solved, as there is much controversy over the manner in which SDP methods capture various legal statutes. In addition, SDP is just one of several research areas that tries to endow data analysis procedures with sociologically desired qualities, such as interpretability.

In this paper, we focus toward concurrently satisfying the demands of data subjects, curators, and users, through the use of synthetic data in their processes. Nevertheless, when practitioners are determining which method to utilize, our argument is that such approaches fail to support them in doing so. In addition to this, it creates entry barriers for anyone who is adequately prepared to make use of the outcomes of the techniques.

Finally, the proliferation of synthetic data will bring about a profound shift in the (geo)politics of data, as well as its economics, ownership, and strategic dynamics. It is a form of technology that merits close consideration.

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Digitalization of Banking Services, Albanian case

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Abstract

This paper focuses on the analysis of the progress of technology implementation, mainly through the application of online services by the banks. In the initial part, there is a review of the literature, with a summary of the basic concepts, advantages and disadvantages of online services and a description of the progress over the years. Meanwhile, the second part focuses broadly on the Albanian situation, the progress made, descriptive analysis of the figures for the use of these services in the country, etc.

Technology has advanced rapidly and has become an important part of people's daily lives. Not only individuals, but also businesses have made it part of their development. Different companies, state institutions and even banks adapted well to these technological changes. Banks, which have never been so important to the society and economy of a country as today, reacted immediately. They brought innovation by using "online banking". This service allows making transfers without going to the bank; no more long queues at bank counters, just a "click" away.

Various transfers and every financial service we need is done through a screen, in a virtual way. But how prepared and informed were people to adapt to all this technological innovation of the banking system? How has our country advanced in the way of digitization of banking services and where are we at the level of the Region? These are the questions we tried to answer through this work.

Keywords: bank, online service, technology.

Jel Code: G21, G38.

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Various transfers and every financial service we need is done through a screen, in a virtual way. But how prepared and informed were people to adapt to all this technological innovation of the banking system? How has our country advanced in the way of digitization of banking services and where are we at the level of the Region? These are the questions we tried to answer through this work.

Online (digital) banking overview.

Development over the years in the sector of online banking services

Technology was developing a lot and penetrating every link of the economy. Even the banks thought to embrace the development of technology and in October of 1980, the term "online" was used for the first time in the banking sector by United American Bank based in Knoxville, Tennessee. New York was the second city to use online banking services. Four of the city's major banks introduced these online services using the videotex system (Cronin, 1997)²⁸. Due to the commercial failure of videotex, these banking services never became popular.

This service managed to cross the ocean and in 1983 the Bank of Scotland became the first UK bank to embrace the innovative technology. A banking service called Homelink was offered to their customers, who had to connect to the internet through their TVs or phones to pay bills and transfer money. The connection was slow and unreliable - but the potential of this new 'telebanking' service was immediately recognized.

Many consumers were reluctant to conduct monetary transactions over the Internet. It took widespread adoption of e-commerce, based on well-known companies such as Amazon.com and eBay, to popularize the idea of paying for items online.

In 1995, Presidential Bank was the first bank in the country to give customers access to their accounts online. So by 2000, 80% of US banks offered e-banking. In 2009, Ally Bank was founded - the world's first all-digital bank²⁹. A study by Fiserve in 2010 showed that both online and mobile banking are were growing at a faster rate than even the Internet.

After the year 2020, the latest reports say that 80% of banking customers globally are regular users of "online banking" technology. But today, at the same time, the structure of the financial industry is being transformed as a result of DeFi and blockchain technology. Technology is advancing so fast that, in the next few years, many experts believe that many Western countries will be officially cashless.

²⁸ Sparks,E.(2007).ABA Banking Journal.Nine young bankers ÷ho changed America

²⁹ England J.(2022) FinTech Magazine. Technology in Fintech and the story of Online Banking

Factors influencing the development of online banking services

Acceptance of the online banking depends on the qualities of the banking service, as security, friendly customer relations, accessibility, time, financial independence play critical roles in the customer's mind (Hamid et al., 2007). Identifying factors that influence customers' intention to use E-banking helps banks to react appropriately to such factors and implement their marketing strategies.

- High-quality Internet: The Internet in people's daily lives has a high degree of application and every day this trend is increasing due to its development and speed. With the increase in the quality of the Internet, the number of online banking users also increases (perhaps with a higher coefficient).³⁰

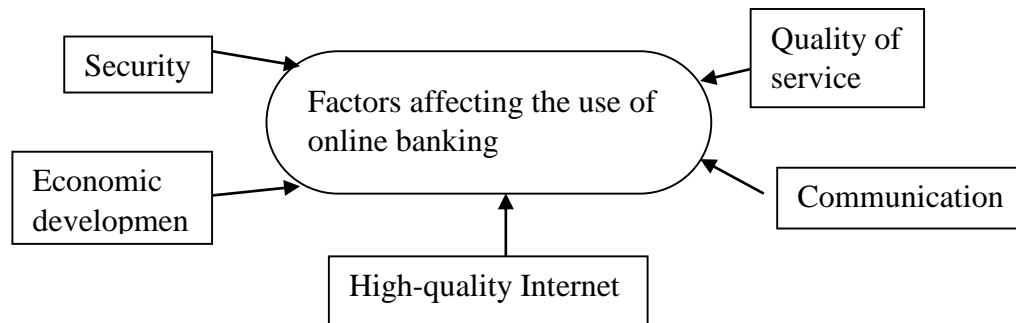
- Communication: In a virtual world, trust is the most fundamental factor and is an important priority for a manager. A virtual organization consists of individuals who do not interact directly. So trust and commitment can be considered one of the most critical issues for managers in the virtual world. Business transactions between partners require more trust because they have to cooperate with each other and create a relationship between different areas, organizations, customers and other entities. The end result of trust between people inside and outside a firm is more frequent relationships and transactions. (Teo and Liu, 2007).

- Quality of service: E-business can offer the firm the opportunity to develop their market share and enter the international market at minimal cost. This makes it possible for companies to be able to create good relationships with producers and customers, thus bringing increased sales and easier access to customers who are far from the business. This interaction increases the possibility of using and performing more frequent financial transactions online.

- Economic development of a country: Highly developed countries have a high number of online banking users because they are more open to change. The high technology structure and the abundant information it conveys to customers increases the use of these services.

- Security: Coded messages from staff, managers and users can be used in the banking system program (Pikkarainen et al., 2004). The design of a security system in accordance with customer needs and security bills are among the main factors that the manager takes into account when designing electronic systems. An investigation of the factors affecting the acceptance of electronic banking shows that security concerns and ignorance of Internet banking are among the most critical barriers to the rejection of this innovation. Lack of security can make the mechanism inactive and neutral.

³⁰ Amin, H., 2007. Internet banking adoption among young intellectuals. J. Internet Bank. Commerce, 12: 1-13.



Levels of online banking development.

The types of online banking services are based on 3 different levels of facilities offered by banks. The division that is created both by the investment made by banking institutions, but also by the willingness of consumers to embrace the technological benefits in providing these very utilitarian services for the developed world:

- Basic / informative level

The basic level refers to a bank's website, which provides information about the various products and services it offers. Customers have limited access to the use of information available on the website and can send questions for more detailed information.³¹ Online banking information includes basic banking provisions such as different types of accounts, loan offers, preferential banking facilities, projects of bank related real estate, nearest bank branch and ATM locations, etc.

- Intermediate / communication level

In this type of online service, banks allow customers to perform simple functions such as applying for various services such as loans and raising questions about your account balance. Communication between the bank and the customer is done through virtual chatbots. These chatbots are equipped to provide general information. They may ask general questions about minimum balance requirements, fund transfers, types of bank accounts and cards offered, etc.

- Advanced / transactional level

The transactional tier is the type of online banking service that deals with all cash-based transaction services. An active online banking account and password are usually required to perform transactions, such as fund transfers, credit card bill payments, utility bill payments, making time deposits and investing in marketable securities. The different types of transactional level are:

National Electronic Funds Transfer (NEFT)

NEFT is a nationwide payment system that facilitates one to one transfer of funds. Under this scheme, individuals, firms and corporations can electronically transfer funds from any bank branch to any individual, firm or corporation that has an account at any other bank branch in the

³¹ Solaimani, F., 2002. The Investigation role of the factors influencing e-banking. IT, No. 1382.

participating country³². Even such individuals who do not have a bank account can deposit money in NEFT enabled branches. However, such cash transfers will be limited to a maximum of cash per transaction. Thus, NEFT facilitates originators or senders to initiate fund transfer transactions even without having a bank account³³.

Real Time Gross Settlement (RTGS)

RTGS is defined as continuous (real-time) settlement of funds transfers. "Real-time" means processing instructions at the time they are received and not at a later time.³⁴ The RTGS system is primarily intended for large value transactions and there is no upper ceiling on transactions.

Electronic clearing system (ECS)

ECS is an alternative method of making payment transactions related to utility bill payments such as telephone bills, electricity bills, insurance premiums, card payments and loan payments, etc., facilitating in this how to improve customer service from banks/companies/corporations/government departments, etc., for collecting/receiving payments.

Immediate Payment Service (IMPS)

IMPS offers an instant, 24/7, electronic interbank fund transfer service via mobile phones. IMPS is a prominent tool to transfer money instantly within banks through mobile and internet, which is not only safe but also economical in both financial and non-financial perspective.

Main advantages and disadvantages.

Pay bills online- This is one of the main advantages of online banking because you don't have to take time out of your day to go to the bank. You can simply log into your account and pay various bills online instantly. From there you can transfer money to other accounts in real time, check the account balance, etc. But in addition to saving time, there are also monetary benefits, as you can lower your overall fees - If your business banks online, your banking fees may be lower, as online banks may not have to pay for the cost and branch maintenance and these savings can be passed on to you.

³² Ross Buckley, Douglas W. Arner, Janos Nathan Barberis, (2016), The Evolution of Fintech: A New Post-Crisis Paradigm, University of New South Wales, pp 12

³³ Moutaz Abou-Robieh, A study of E-Banking Security Perceptions and Customer Satisfaction Issues, Faculty of Argosy University, 2005, pp 31

³⁴ Thulya Palihapitiya, Blockchain Revolution in Banking Industry, University of Moratuwa, Sri Lanka, (2020), pp2

While online banking is always improving, there are some disadvantages for business owners who rely on instant and constant access to their banking services. Banking institutions are doing their best to minimize it, but it takes a lot of work to completely eliminate it:

- Technological interruptions- Online banking requires a strong internet connection. If the Internet is interrupted by a power outage, server problems at your bank, or if you are in a remote location, your ability to access your accounts may be affected by being disconnected.³⁵
- Lack of a personal relationship- A personal relationship with your bank may be able to provide an advantage over online banking. Whether you need a business loan, a new line of credit, a fee waiver, or to make changes to your current banking needs, this relationship is a very important factor.³⁶ Personal banking relationships can also help you establish a business account tailored to your specific needs. They can also make notes in your files about cheques, cash deposits and international payments so you can avoid holding onto your money for too long.
- Privacy and Security Concerns - Financial institutions have very good security, but no system is foolproof. Valuable information is always prone to hacking, but you can prevent this if you take the necessary precautions during the information you provide when logging in. Hackers can access accounts and transfer money without the customer's knowledge.

Online banking in Albania (analysis over the years)

The beginnings of online banking

In Albania, the use of online banking appeared later and developed at a slower pace, due to many economic, political and social factors. Albania had numerous problems that hindered penetration and adaptation to this system, such as internet not of high quality, a lot of informality, little information and lack of banking culture. So the slow steps in the development of the banking system itself inhibited the use of online banking.

This system of online services appeared in our country after the 2000s (20 years later), specifically in 2002 by the American Bank of Albania - ABA (Banks in the Internet Age 2007). By 2006, the number of online subscribers to American Bank of Albania increased from 720 to 1,340 (almost 86%) making it one of the fastest growing distribution channels for the Bank (ABA Annual Report 2006).³⁷

³⁵ Tatiana Tropina, 2016, Do Digital Technologies Facilitate Illicit Financial Flows, Max Planck Institute for Foreign and International Criminal Law, pp 14

³⁶ Cajetan Ikechukwu Mbama, Digital Banking Services, Customer Experience and Financial Performance in UK Banks, (2018), pp 1

³⁷ Bank of Albania, Annual Supervision Report for the years: 2000-2022.

Although in the Albanian market a large part of the banks were supported by powerful groups of foreign banks, they have started to apply the e-banking service in the years 2007-2009 (Table 1), with the exception of Intesa San Paulo, which offers this service since 2003.³⁸

Also during 2007 some other banks offered limited services mainly to their corporate clients. Initially, banks started implementing ATMs. During this year, the number of electronic money increased from 34,090 to 295,250. This progress came from the fact that all budget salaries began to be paid through banks. The increase in the use of electronic money has gone hand in hand with the increase in banking transactions. The number of credit cards increased from 806 (in 2004) to 4245 (in 2007). Debit cards increased from 6,552 to 70,176 (Annual Report of the Central Bank of Albania 2007).

Table 1 : Year of starting to use online banking

Bank	Intesa San Paulo	Emporiki	NBG	Credins	Raiffeisen	BKT	UBA	ProCredit	Banka Popullore
Year	2003	2007	2008	2008	2008	2008	2009	2009	2009

Source : Ministry of Financave

Pandemic situaton, impact.

Albania seems to have adapted very well, but the increase in the use of online banking seems to have reached its peak in 2020-2021. The main factor for this was the "Covid-19" pandemic, where businesses and individuals had no other choice for performing banking services. even the skeptics became users of home banking. Unlike other businesses, which were unprepared, banks were better prepared because the digital revolution had already begun. Banks simply needed improvements. The "Covid-19" pandemic served as a catalyst for digitization.³⁹

Table 2 : Transactions through online banking system

<i>Transaksione home banking në vite</i>							
	Vitet						
Përshkrimi	2015	2016	2017	2018	2019	2020	2021
Numër Transaksionesh	1,404,052	1,791,989	2,263,607	2,911,837	3,623,642	4,119,802	5,129,064
Vlera (në milionë Lek)	282,756	343,583	550,096	885,777	960,060	1,044,936	1,206,352

Source : BoA

³⁸ Ndrenka, A (2012), Security of e-banking applications, Bankieri magazine, no 2, pg 33.

³⁹ Shehu, E (2021), Banking sector, "vaccinated" against the pandemic,

Online banking in Albania in 2022 is offered by 11 banks. The growth of electronic payments has led to a continuous contraction of credit transfers in paper form, which in 2021 accounted for about 20.65% of the total volume of payments. Card payments occupy the main place in the use of payment instruments, namely 55.57%.⁴⁰

The measures taken by BSH during 2020 are estimated to have contributed to the increase in the use of "home banking" transactions; the spread of opportunities to access the Internet and the familiarization of bank clients with the use of this instrument.⁴¹ Also, it is estimated that the banks' policies for the promotion of these alternative payment methods played a positive role, which is reflected in the increase of accounts accessible remotely by about 20.98% compared to the same period of 2020. Accounts accessible from the Internet to of the total of all customer accounts occupy a share of 23.25 % in 2021.

Conclusions.

In addition to the direct individual work that the bank does with customers, in the context of financial education through various advertisements, it is necessary for the entire financial and economic environment in which we operate to be oriented towards digital platforms. For example, many services should be performed with side of the cards so that the culture of using online banking comes gradually and not as imposed. These efforts bring positive results for all actors, customers, state institutions, banks and as a whole for the economy itself. It should also be financed in the technology of saving customer data so that their account is as safe as possible, thus encouraging the use of online banking.

Although the online banking service in Albania appeared 20 years later and at first it was difficult for them to adapt due to many factors, it is noticed that recently it is progressing at a fast pace. Based on the statistics obtained mainly from the Bank of Albania , the increase in transactions has been high, especially during the various reforms. People have managed to gradually understand the advantages, but despite this it seems that there are still many skeptics who refuse to use it, therefore banks should be even more competitive with each other to bring innovation to encourage everyone. They must provide a compelling and competitive advantage at the same time by considering even the smallest details (perhaps even the application) that influence a positive customer reaction. Not only the benefits in time or cost should be made clear, but also to create confidence that their account is safe.

⁴⁰ Albanian Association of Banks, Annual Reports 2014-2021

⁴¹ Bank of Albania, Banks in the internet age

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Solutions based on information and communication technologies for the circular economy

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Abstract

As a potential path to a more sustainable economic system, the circular economy (CE) concept is gaining traction in academia, industry, and policymaking circles. Information and communication technology (ICT) systems have impacted every aspect of contemporary life, including the CE. Big data, cloud computing, cyber-physical systems, the internet of things, virtual and augmented reality, and blockchain can play an integral role in adopting CE concepts and implementing CE programs by governments, organizations, and society. This paper conducts a thorough literature review of the prominent ICT solutions that pave the way for a circular economy. For the categorization of the solutions, a novel two-fold approach is introduced, focusing on both the technological aspect of the solutions (e.g., communications, computing, data analysis, etc.) and the primary CE concept(s) that each solution is most relevant to (i.e., reduce, reuse, recycle, and restore). Each solution's role in the transition to CE is emphasized. Results indicate that ICT solutions pertaining to data collection and data analysis, in particular the internet of things, blockchain, digital platforms, artificial intelligence algorithms, and software tools, are among the most frequently proposed solutions by academic researchers. In addition, the results indicate that greater emphasis is placed on the "reduce" component of the CE, although ICT solutions for the other "R" components and holistic ICT-based solutions do exist. The adoption of ICT solutions for the CE is also hindered by a number of significant obstacles, including consumer and business attitudes, economic costs, potential environmental impacts, a lack of education surrounding the CE, and a lack of familiarity with modern technologies.

Keywords: IoT, Big Data, Machine Learning, Economy, Blockchain

Jel Code: Q50, Q51, Q55

Introduction

Circular Economy (CE) arose in the 1970s from decreasing the consumption of inputs for industrial production, but it has proven to apply to any resource [1]. During their investigation of the relationships between different types of economic activity and the natural environment, Pearce and Turner (1990) first presented the notion of CE [2]. CE advocates a modification in the "extraction-production-disposal" paradigm of the linear economy (LE), which is currently widely implemented in the industrial environment [transitioning to a circular economy], through the prospect of making human activity more robust by applying the natural cycle model. A transition from economic systems founded on linear, resources-to-goods-to-waste processes to approaches that reuse, remanufacture, and recycle materials is at the foundation of the circular economy (CE) concept [3]. The "circular economy" is "an economic model aimed at the efficient use of resources through waste minimization, long-term value retention, reduction of primary resources, and closed loops of products, product parts, and materials within the boundaries of environmental protection and socio-economic benefits." [4]. The circular economy may be the key to achieving sustainable development while at the same time mitigating or eliminating the adverse effects of environmental degradation and depletion of natural resources [5], [6], [7]. The term "circular economy" (CE) has garnered increasing attention over the last five to ten years, including policymaking, lobbying and consultation, and scientific research. Circular Economy (CE) as a strategy to tackle environmental concerns and promote sustainable development has recently gained a growing amount of attention in discussions regarding industrial development. These discussions are significant and developed by policymakers like the European Commission and other business advocacy organizations like the Ellen MacArthur Foundation and McKinsey [8]–[10].

Numerous firms and policymakers embrace CE, but its implementation is still in the early stages for many reasons. CE's biggest issue involves stakeholders across the supply chain with varying operations and mindsets [11]–[13]. To date, the circular economy (CE) implementation strategy has relied on several 'R' frameworks, including (but not limited to) R0-Refuse, R1-Rethink, and R2-Reduce to enhance circularity for smarter product usage and manufacturing; R3-Reuse, R4-Repair, R5-Refurbish, R6-Remanufacture, and R7-Repurpose to increase the service life of products or parts; with R8-Recycle and R9-Recover being the methods for reusing materials sensibly. From a systems viewpoint, practitioners have applied these 'R' frameworks in various contexts [12]. Using ICTs to study and advance CE digitalization has recently become a hot topic [14]. While this shift has aided CE stakeholders' digital transformation, it has not been analyzed in detail, and it has not put into question the viability of ICT-enabled digital solutions throughout the CE network or for the engaged stakeholders [15]. Therefore, given the abovementioned problem, a thorough investigation of possible ICT-enabled digital solutions implementation to CE is needed. ICT is a "set of technological tools and resources to transmit, store, create, share or exchange information. These technological tools and resources include computers, the Internet (websites, blogs, and emails), live broadcasting technologies (radio, television, and webcasting), recorded broadcasting technologies (podcasting, audio and video players, and storage devices), and telephony (fixed or mobile, satellite, Visio/video-conferencing, etc.)" [16]. Therefore, this study investigates suitable ICT-enabled digital CE implementation options. ICT integration is

complex without a full awareness of the challenges grouped into five categories: Technological, Financial, Infrastructural, Institutional, and Societal.

Literature Review

ICT Enabled solutions to circular economy and barriers to adoption

We classified our results into the four most used technology solutions for the circular economy: (1) Blockchain, (2) Big Data, (3) the Internet of Things, and (4) Artificial Intelligence and machine learning. The literature review has generated a list of prospective ICT-classifiable technologies. Their applications are indeed associated with the circular economy. Integrating cyber-physical systems with Big Data, machine learning, data mining, data analytics, the Internet of Things, and blockchain increases the likelihood of creating sustainable value for industry and business within the context of the circular economy [17], [18]. This section discusses, in particular, the most prominent ICT-enabled technologies and how those technologies influence CE.

IoT and CE

IoT means "Internet of Things." or equipping electronic equipment with sensors that grant them the capacity to communicate with one another and the opportunity to take part in the operation of an information network [19]. IoT has the potential to be a disruptive breakthrough in the circular economy, resulting in the development of new business models for the circular economy (CE), which is projected to be worth \$4.5 trillion by 2030. This vision relies on the Internet of Things: IoT and circular economy include system redesign and intelligent, informed asset management [20]. In addition, IoT is used to collect cloud-based data and analyze modern industries and manufacturing [21]. The application of the Internet of Things (IoT) in industry, also known as the Industrial Internet of Things (IIoT), provides a new level of connectivity across the operations of the automotive sector. This new level of connectivity includes a connected supply chain, production, and services, as well as operational monitoring of both the vehicle's status and its status within the context of the overall road infrastructure [22]. As a typical industry, the automotive sector is strongly pushing toward looking at the complete lifecycle of vehicle components and designing products for reuse and remanufacture [23]. According to [24] IoT can enable a sample solutions business model, track and record in-use and post-use items, monitor conditions and predictive maintenance, increase lifespan projections of used products, and guide design decisions to improve product durability. In terms of CE, IoT enables a smart healthcare waste disposal system and integrates its output via a circular economy viewpoint to maximize material retention while minimizing environmental and social effects.

In addition, IoT can allow smart environments and improve urban planning [25]. An IoT-made DSS for Circular Economy Business Management resource-efficient is proposed by [26]. Their concept combines forward and reserve logistics methods with IoT. The approach uses reverse logistics loops to reuse, repair, remanufacture, recycle, and cascade to phase out linearity and associated waste. Despite the benefits listed above, IoT-enabled looping strategies like remanufacturing, recycling, and reuse have received little attention in practice. Barriers like the lack of innovation capacity, difficulty securing financial resources, technologies changing too fast,

problems in technology integration, lack of accountability, and weak enforcement of relevant laws and regulations affect CE IoT adoption [27].

Blockchain and CE

Blockchain has become a catchphrase and is attracting the attention of various industries. Distributed software architectures and computing infrastructures are the building blocks of blockchain, a novel type of data storage. It allows for the data to be decentralized and dispersed [28] "Decentralized architecture, fault tolerance, and cryptographic security features including pseudonymous identities, data integrity, and authentication," necessary for CE's digital transformation, BCT's implications are gaining popularity and being explored in numerous areas [29], [30]. Blockchain-enabled data-driven solutions may support CE business models with enhanced supply-chain transparency, shared and performance economy platforms, stakeholder trust involvement, and organizational governance and administration [31]. The decentralized digital twin cycle model employs blockchain to enhance the data value chain regarding data sharing, cybersecurity, data integrity, immutability, traceability, and information transparency or confidentiality. The DDTC model may decrease data silos within the building, engineering, construction, operations, and mining business by employing decentralized IT infrastructures [32]. [33] proposes Plastic recycling powered by multi-sensor-driven AI and blockchain tools that bridge the information gap and improve plastic waste segregation and recycling processes. Blockchains in fostering a circular economy have been strongly detected in spare parts management (quality reports, repair or reuse real-time status, etc.), enhanced transparency and traceability of manufacturing processes, or integrity and verifiability of ethical working practices, which positively impacts the company's Corporate social responsibilities [34]; Other applications of Blockchain in CE include the blockchain-based infrastructure used in countries with autonomous trash collection and storage [35], entire circular scenarios, and the execution of an upgraded recycle-reward and e-waste management service that extends the working life of electronic assets, improves e-waste management and boosts the economic function of participating companies [36]. [37] have introduced use cases of blockchain in agriculture, forestry, fishing, mining, manufacturing, transportation, communication, and retail trade. Furthermore, according to [38], blockchains enable consumers and small renewable generators to become more active in the energy market and monetize their assets through disintermediation, transparency, and tamper-proof transactions in the energy market. The IBM project's blockchain application to mining operations integrates production, commerce, consumers, product end-of-life fate, and E-waste management, including recycling, reuse, and refurbishing. Furthermore, blockchain architecture ensures confidence in profit sharing and intellectual property protection and links to E-waste management techniques that lessen health and environmental concerns [39]. Blockchain technology can assist the circular economy by reducing transaction costs, improving supply chain performance and communication, protecting human rights, improving healthcare patient confidentiality and well-being, and reducing carbon footprint [40].

Aside from the advantages and benefits blockchain delivers to the circular economy, it poses significant obstacles and barriers to deployment. Some challenges include organizational barriers, technological change, interoperability, reluctance [41], Scalability, Data Storage Capacity,

Management Challenges, Policy, and Regulatory Challenges, Financial Challenges, and Lack of Skilled Workforce [31]. In addition, lack of trust, transparency, information traceability, inefficiencies, blockchain networks governance, lack of collaboration, fragmentation in data silos, high implementation costs, low productivity, adversarial practices, poor digitization, cybersecurity risks, difficulties enforcing standards and regulations, lack of accountability, data interoperability, blockchain interoperability, and environmental sustainability are some other challenges that need to be addressed to implement Blockchain in CE successfully [32], [34], [37], [38].

Big Data and CE

Big data refers to vast, dynamic, and continuous databases that are difficult to analyze due to their complexity. Based on Big Data technology, viable, sustainable solutions include innovation, waste management, innovative economic and ecological systems, smart consumption, production, business strategies, green public procurement, and agile management [41].

The use of big data technologies can give social, economic, and environmental possibilities and novel solutions for circularity practices in the healthcare industry, particularly during a pandemic when medical waste is rising [42]. Another Big data manifestation may be in cryptocurrency and municipal waste management industries[43]. Furthermore, big data is essential in supply chain management [44] since it enables new ways of organizing and evaluating supply network activities to improve supply chain performance [45] as it incorporates many parts of the CE through physical, cyber, and stakeholder interactions, the integration of big data and large-scale collective decision-making can promote circularity by resolving various issues about the linear economy [46]. Big data could originate from a wide variety of sources, some of which include product and machine design data, product and process-quality data, records of manual operations carried out by staff, manufacturing execution systems, fault-detection and other system records, and product and process-cost data, monitoring installations, logistics information, including information provided by third-party logistics providers, consumer information on product usage, feedback, and more [47]. Data mining (DM), a method that sorts and clusters data so that it may be re-injected into a design domain using statistical algorithms, is one of the most often used tools in this area. It is also one of the most complex technologies. DM is frequently used in a more comprehensive data modeling process known as "Knowledge Discovery from Data" (KDD) [48]. Additionally, big data enables more current business strategies, which might propel CE. But like every other technology, it embraces challenges and faces barriers to adoption. High financial investment is necessary for the development and deployment of circular technologies, Laws, and administration of the government, "Challenges in identifying the economic benefits of environmental investments," "Lack of financial capabilities and resources on environmental investments," "Lack of circular policies, incentives, and regulations in healthcare," "Lack of the top management support and commitment about circularity," "Complexity of circularity," and "Lack of financial capabilities and resources on environmental investments" are some of the challenges [42]. With an increasing risk coming from the cyber-attacks possibility of data being stolen, and obstacles with data protection due to the decentralized origin are some other issues related to Big Data applications in CE [43].

Artificial Intelligence and machine learning in CE

AI is applicable across sectors. It can be applied in waste management, especially in plastic recycling. Multi-sensor-driven AI technologies retrieve crucial data such as color, form, density, and physical and chemical makeup of plastic garbage [33]. In the same category, multi-sensor data fusion methods utilizing artificial intelligence assist in sorting commingled plastic garbage by physical properties criteria, including color, polymer type, and density [49]. Industry 4.0 relies heavily on artificial intelligence and other technologies. There are several ways in which the application of AI algorithms may improve CE, such as through the analysis of real-time data to reduce traffic congestion or the optimization of cooling systems' energy consumption. Artificial intelligence advancements have led to the creation of very effective analysis algorithms that have aided in areas such as prediction, optimization, pattern recognition, etc. The transition from linear to CE economic models has been seen to have benefited from AI [50]. Maintaining a streamlined operation of circular business models is necessary. Artificial intelligence (AI) can help in these situations because it combines historical and real-time data from producers, distributors, and end users to make circular business models more robust. Incorporating this into automated business processes and decisions would be a real benefit. Machine learning algorithms can predict the uncertain performances of various processes, monitor those processes in real-time, predict the uncertain performances of various processes and detect flaws in circular systems [51]. Managerial decision-making is another area where AI may be of great assistance. Artificial intelligence's decision tree algorithm has been incorporated into factory-wide environmental cost management systems [52]. Ramadoss in 2018 suggests intersecting technologies. Using Big Data to describe the vast amounts of data produced during production, usage, and disposal. This data may be evaluated using big data business analytics and artificial intelligence (AI) to enhance logistics and asset management in the circular economy. In another sector, the environmental impact of steel production processes may be reduced with digitalization and artificial Intelligence and Machine Learning [53]. Among positive applications in CE, Artificial intelligence and Machine learning face the main challenge related to cybersecurity and data privacy.

Tools and methodology

This literature review was conducted using the Scopus database. We reviewed 320 articles, of which 165 were open-access papers with findings in technologies related to the circular economy.

The search terms used for this paper were:

(IoT AND "Circular Economy") OR ("Big Data" AND "Circular Economy") OR ("ICT" AND "Circular Economy") OR ("Blockchain" AND "Circular Economy")

We searched meta-data such as "Title," "Abstract," and "Author Key Words." The data collected were published from 2019 to 2022, considering journal articles and conference proceedings papers in English. All the papers considered for this study had to meet the Open Access criteria.

The data of the papers obtained were extracted in CSV format. We reviewed the file for further normalization of the data in it and finally analysed it with Biblioshiny from RStudio.

R Package Bibliometrix, presented with Biblioshiny software, is a collection of open-source tools for quantitative research in scientometrics and bibliometrics that incorporates the essential bibliometric analytic techniques. Bibliometrics enables us to emphasize the most pertinent documents, journals, nations, authors, and institutions and analyze and display the many research collaboration networks that have been developed or emerging trends in a particular field of knowledge. Numerous investigations have been conducted utilizing the R Package Bibliometrix. Works in the fields of social research and data science, Internet of Things logistics, biology, and artificial intelligence research are only a few examples [54].

Results

The data collected were published from 2019 to 2022. There was a 45.02% annual growth rate per publication a year, which means that the interest in the circular economy field, especially in the solutions technology can give in this concept, is increasing.

The average citation per document is about 15.85 citations per document, which is a considerable number given that the average age of the documents is 1.07 years.

The ICT-enabled technologies in the circular economy under consideration were divided into four primary major groupings for this analysis. These groups are as follows: (1) Blockchain; (2) Big Data; (3) the Internet of Things; and (4) Artificial Intelligence and machine learning. The implementation of these technologies is met with a wide variety of challenges and obstacles, which may be broken down into five categories: technological, financial, institutional, and societal in character.

Table 1: Barriers and challenges grouped by individual challenges.

BARRIERS AND CHALLENGES GROUPED	INDIVIDUAL CHALLENGES	AUTHORS
Technological	Data Storage Capacity	[31]
	Smart Contracts and Platforms	
	blockchain networks governance	
	fragmentation in data silos	
	poor digitization, lack of traceability of information, cybersecurity risks	[32]
	data interoperability, blockchain interoperability	

	technological security and stability issues	[34], [37]
	new algorithms that can be prone to errors	[38]
	technological change	[31]
	data privacy	[31], [32], [43], [53]
	issue of cybersecurity	
	financial challenges	[31]
Financial	high development costs	[32], [38], [42]
	lack of financial capabilities and resources for environmental investments	
	infrastructure challenges, including failures of interoperability	[37], [55]
Infrastructural	low level of industrial application	[34]
	Scalability	
	management challenges	[31]
Institutional	cultural and organizational challenges	
	lack of skilled workforce	
	organizational barriers	
	reluctance	[55]
	lack of collaboration	
	lack of productivity	
	policy and regulatory challenges,	[31], [34], [38]
	difficulties enforcing standards and regulations	[32], [34], [38]
Societal	environmental sustainability	
	unfavorable government legislation and execution of circular healthcare	
	lack of circular policies, incentives, and regulations	[42]
	challenges in identifying the economic benefits of environmental investments	

Based on the four most used technology solutions presented in this paper, different applications coincide with some of the 'R' frameworks, such as "Reduce," "Reuse," "Recycle," "Refurbish," and "Recover."

Table 2: Applications in relation to the CE principles.

APPLICATION	EXAMPLES AND REFERENCES	CE PRINCIPLE
Supply chain	Tamper-proof, distributed data records can influence customer behavior and encourage more companies to use less dangerous chemicals and emit less [37] ability to track complicated supply chains/product lifecycles and sustainability [50], [45] In addition, reusing and reusing items needs the entire product and material information [30], [37].	Reduce, Reuse, Recycle
Waste Management	Smart contracts to enhance recycling efficiency, Waste exchange platforms [35], [37], Reverse logistics [35]. E-Waste management through blockchain architecture [39], healthcare waste management [42], recycling plastic waste using multi-sensor-driven AI and blockchain tools [33], and multi-sensor data fusion tools using artificial intelligence help in accurate segregation [49]	Reduce, Reuse, Refurbish, Recycle Recover
Sharing economy	Sharing platform provision (no third party, trustworthy information) [37].	Reduce, Reuse,
Renewable energy	Peer-to-peer energy trading [38]. enhance the data value chain regarding data sharing [32], digitalization, and machine learning can improve the	Reduce, Reuse, Recycle

Construction	environmental footprint of the steel production processes [53].	Reuse Recycle
Municipal waste	Big data for municipal waste [43].	Reduce, Reuse, Recycle, Refurbish, Recover
Cryptocurrency	Big data for cryptocurrency [43].	Reduce, Reuse, Recycle, Refurbish, Recover

Conclusions and recommendations

The shift from a linear economy to a circular economy involves the participation of stakeholders and the redesign of systems to meet the innovation of business models. This research is dispersed throughout various fields, publications, journals, methodologies, and topics. This study has shown that there is an increasing rate, 45.5%, of publications related to circular economy and technologies that can help implement this concept. Furthermore, the excellent collaboration between countries makes it a very compelling topic for other researchers interested in these themes. There were many valuable publications from relevant sources with top-cited authors, and considering the time taken into consideration was only four years, it makes future trends finding ICT solutions to help a circular economy. Word analysis helped us better understand the new technology trends that help implement a circular economy. 'Big Data' and 'Blockchain' are the newest technologies being studied concerning the circular economy but not overlooking two meaningful solutions analyzed such as 'The Internet of Things and 'Artificial Intelligence.'

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An Internal Audit and Control Instrument for Application of Circular Economy Principles in Albanian Enterprises

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Abstract

On-going global challenges such as the Covid-19 pandemic, the climate change, civil unrest, and global value chain restructuring are pressing enterprises, policymakers, and investors on implementing environmental, social, governance (ESG) strategies making it an essential operational priority. Application of ESG principles constrains enterprises to include these features in the business model and to estimate their impact on profitability, liquidity, supplier choice, and relationship with whole society. The focus of this paper is the environmental component of the ESG strategic model, which is primarily based on implementation of principles of circular economy, biodiversity, resource efficiency and waste management. Based on international best practices and the COSO integrated framework we propose an internal audit and control instrument that can be applied to Albanian enterprises to oversee their environmental activity and progress on circular economy. The internal audit and control instrument includes four main areas related to circular economy (governance, risk management, strategy, and reporting). The proposed instrument offers a solution to monitoring key challenges of circular economy such as loss of biodiversity, increased generation of waste and pollution, etc. as well as it reveals upgrading opportunities for Albanian enterprises.

Keywords: internal audit, internal controls, COSO framework, circular economy, ESG

Jel Code: M41, M42, F64

1.Introduction

The global economy is facing multiple challenges such as mitigating the impact of Covid-19 pandemic, various climate change risks, social turbulences, global value chain transformations. Under these pressures business leaders, policymakers, and investors representing most world countries have been working on developing environmental, social, governance (ESG) framework making it a key instrument for a sustainable doing business environment. The ESG framework is composed of three main components that enterprises need to optimize throughout the organization.

The first component refers to environmental factors. These factors include the impact and risks that operations and activities of enterprises have on the environment such as direct and indirect greenhouse gas emissions, contamination, management of natural resources, climate change resiliency, waste management, biodiversity, and circular economy (Adams & Larrinaga, 2019). The second component relates to the relations and interactions any enterprise has with its stakeholders. This includes several factors such as human rights, diversity, equality, health and safety, wellbeing, training and upgrading of employees, promotion of disadvantaged communities, preservation of cultural heritage, etc.

A main feature of ESG is in what ways social impact extends outside enterprises especially when dealing with value chain partners in developing countries where both environmental and labor standards are fragile. The third component reference to governance focusing on the transparency and accountability towards expectations of stakeholders and how shareholders rights are viewed and honored and the types of internal and audit control procedures to continuously inform stakeholders on the performance of the enterprise. Governance includes also additional factors such as risk management, investments, information systems, supervision and reporting, ethics and integrity, corruption and bribery, tax related issues (Schulze, 2016).

The ESG framework is widely regarded as the value creation of the enterprise and as a main message that any leadership and employees in enterprise need to embrace and promote. Several studies have shown that enterprises which put efforts on application of ESG are valued higher than enterprises than enterprises that delay or do not participate in integrating ESG in their activities (Esposito et al., 2019). Even though worldwide many enterprises are still behind in implementing ESG and aligning with 2030 sustainable development goals (SDGs), are still better perceived by customers and are more inclined to embrace the “go green” agenda. This agenda is

In this paper we will focus on the environmental component of the ESG and how it affects the circular economy. We will propose an internal audit and control instrument includes four main areas related to circular economy. The proposed instrument offers a solution to monitoring key challenges of circular economy as well as it reveals upgrading opportunities for Albanian enterprises (Andrews, 2015).

2. Literature review

Circular economy has gained much attention within the last decade. This circular economy model seeks to address the limited resource consumption that the global economy is experiencing. global economic (Frishammar & Parida, 2019). The circular economy aims to reduce and potentially to eliminate waste and pollution, maintaining products and materials in use for as long as possible. It aims to invent and design more durable, reusable, repairable and recyclable products that can circulate in the economy much longer than products and materials subject to a linear economic model. In a linear economic model, resources are extracted serving as inputs in manufacturing of products. After manufactured products are used and then are thrown away (Helander et al., 2019)

The circular economy is based on three main principles that include elimination of waste and pollution, circulation of products and materials, and regeneration nature. Contrary to the linear model of production and consumption that is based on using resources and disposing waste, the circular economic model intends to minimize depletion of raw resources by reusing and reducing waste, water, and energy. A circular economic model is considered an alternative solution to production and consumption to address climate change and biodiversity depletion (Imoniana et al., 2020).

The existing literature provides much evidence that circular economic models are conquering linear models as on a global scale enterprise are expanding on this model, indicating that even policy makers are recognizing the potential of circular economy and supporting policies that might support its promotion (Massaro et al., 2016). Innovative products and contractual agreement designed for the circular economic models are available in a variety of forms from innovative designs of materials and products facilitating application of the circular model across different segments of the value chain. In addition, to how products are designed, the circular economic model also involves changing the way people consume and use goods and services, rethinking the form of daily consumption that is more popular in the developed countries. The circular economic model also encompasses restoring wilderness, building regenerative agricultural systems, using renewable materials and energy sources (Jacobi et al., 2018)

The circular economy has wide institutional support including initiatives of the European Commission such as the Circular Economy Action Plan (CEAP), released in March 2020, is one of the main building blocks of the European Green Deal. The European Commission states that transition to a circular economy will reduce pressure on natural resources and will create sustainable growth and jobs. The circular economy is also a prerequisite to achieve the 2050 European climate neutrality targets and to cease biodiversity loss (Michelon et al., 2019)

The circular economy is also affecting the accounting and auditing profession in which as it closely relates both to environmental depletion and climate change are bringing much challenge to resources that serve as main inputs and production drivers of existing economies (OECD, 2019). These changes have reversed the accounting and audit logic as production is replaced with sufficiency, reuse as much as possible, recycle what cannot be reused, repair what is broken, and remanufacture what cannot be repaired. As such organizational functions such as auditing and internal controls need to tackle the alternations in the operations of organizations resulting from the circular economy. In 2021 transition to the circular economy has been included as on the six key environmental objectives for sustainable finance appearing in both the European Taxonomy Regulation and the Corporate Sustainability Reporting Directive (European Commission, 2020).

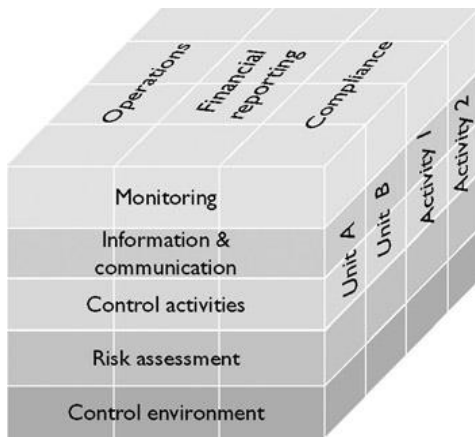
Auditing and internal controls consists of assuring information records, analyses, and reporting about application of the circular economy. Additionally, auditing, and internal controls include a

systematic and continuous evaluation of accounting records and related operations to determine adherence to principles, rules, policies and issued standards related primarily to sustainability accounting (Bannier et al., 2019) Auditing and internal controls based on sustainability accounting aims to protect resources and assets by assessing and monitoring the effectiveness of the enforcement rules in production value chains. Sustainability accounting considers economic, environmental, and social factors to assets and protect the interest of society at large when reviewing enterprise transactions. There are many sides to auditing and internal controls in the circular economy including waste auditing and waste minimization, lifecycle assessment, design for environment, industrial ecology, zero emission, resource suitability and cascading, and responsibilities for consumption and waste. As a result, through auditing, internal controls and technological innovation, enterprises have achieved both favorable economic and environmental records (De Juan & Segui, 2019).

Auditing and internal controls in the circular economy consists of a procedural audit to evaluate use and inputs in operational processes and identify if circular economic model is applied in any form. The auditor investigates the environmental costs and quantifies the waste to evaluate the environmental impact of production in total environmental costs and quantifies the wastes based on expert opinion. view of minimizing the waste and use of resources (Iacovidou et al, 2021).

3. Tools and methodology

The internal and auditing instrument that we propose in this paper is based on the integrated internal control framework of the Committee of Sponsoring Organizations of the Treadway Commission (COSO) This framework has global prevalence and it is identified as a leading framework for designing, implementing, and conducting internal control and assessing the effectiveness of an enterprise (Helander et al., 2019). The integrated internal control COSO framework enables enterprises efficiently develop and maintain systems of internal control that can enhance the potential of any enterprise to and adapt to changes in the business and operating environment including the circular economy. Internal control helps entities achieve important objectives and sustain and improve performance. Designing and implementing an effective system of internal control for the newly circular economic models can be challenging as it demands enterprises to be agile in quickly changing their operations and in aligning with the complex regulatory requirements of the circular economy (Iacobi et al., 2018).

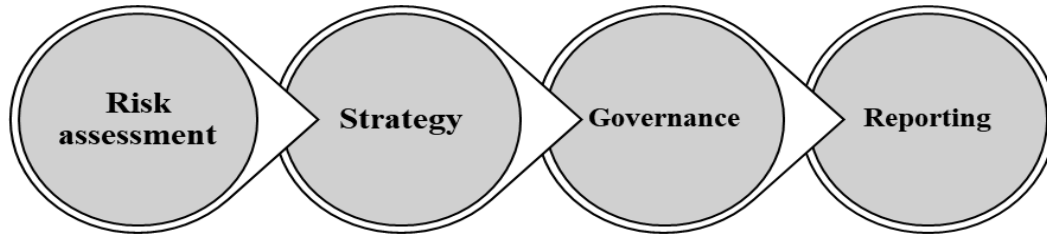
Figure 1: The integrated and internal COSO model

Source: The Committee of Sponsoring Organizations of the Treadway Commission

The COSO framework has five integrated components of internal control including control environment, risk assessment, control activities, information and communication, and monitoring activities. Control environment refers to a set of policies, processes, and structures that will become the foundation of internal control for an enterprise (Michelon et al, 2019). The control is primarily based on integrity and ethical values, commitment to competence, and a culture to upgrade human resource policies. To continue, risk assessment refers to how an enterprise manages its risks. A sound system of risk assessment is based on enterprise inclusive objectives, risk identification, risk analysis and risk change. To continue, control activities are steps or actions included in the policies or standard operating procedures that are applied throughout the enterprise. Control activities are based also on policies and procedures that will ensure the security and change management within the enterprise. A key support to internal control comes from both internal and external information and communication sources. A sound information and communication system are based on quality information and effective channels to disseminate the information. Finally, monitoring activities are the ones that ensure that all five components of internal controls are working according to predetermined guidelines and procedures (Adams & Larrinaga, 2019).

In this paper we have taken the components of the COSO framework, we introduce an instrument that can support enterprises in Albania to embrace to embrace the circular economic model. The proposed instrument is based on a risk assessment approach that many enterprises need to go through while applying the circular economy. The main elements of this instrument presented in Table 1 are (i) risk assessment, (ii) strategy, (iii) governance and (iv) reporting (Figure 2).

Figure 2: The proposed instrument for auditing and internal control of the circular economy



Source: Author`s adaption of the COSO model

Table 1: Main elements of the proposed instrument for auditing and internal control of the circular economy

Risk assessment (management of natural resources, emissions, and waste management)		
Risks	Audit and internal control approach	Indicators
Absence of a long-term strategy of the enterprise aligned with a circular business model.	Presence of an approved enterprise strategy communicated to board of directors and all management levels of the enterprise includes the scope of the objectives, the mitigation strategy together with a timeframe for the application of a circular business model.	-Written and approved strategy document by the board of directors. -Yearly written and approved assessment of strategy objectives. -Yearly written and approved updates of scope and objectives.
Absence of a specific action plan that assures implementation of the enterprise strategy.	-Verify that the strategy has a detailed action plan with specific mostly quantitative objectives. -Verify that the action plan has measurable and time bound outcomes that enable to detect any delays or deviations from the initial plan	-Written and approved action plan document by the board of directors. -Yearly written and approved assessment of the action plan to identify delays or deviations from the initial plan. -Yearly written and approved updates of the action including objectives and outcomes.
Non-compliance with standard of the circular economy the	-Confirm that the enterprise complies with the regulations and requirements of a specific standard.	-Number of penalties received for noncompliance with the standard. -Key performance indicators (KPIs) to assure adherence to the specific standard and corresponding updates.

<p>enterprise has decided to fulfill.</p>	<p>-Assure periodic performance reviews on the implementation of the standard.</p> <p>-Verify that the enterprise has indicators to monitor adherence to the standard.</p>	
<p>Regulatory risk refers to on-compliance with laws, bylaws, policies, decisions, etc. that regulate circular economy in the country and the corresponding industry.</p>	<p>-Review of applicable legislation (national, regional, and local) on the circular economy.</p> <p>-Review of unmet regulatory industry obligations to implement a circular business model.</p>	<p>-Number of pending mandatory regulatory requirements to be implemented according to the specific industry.</p> <p>-Number of pending remedial regulatory actions required from regulatory amendments.</p>
<p>Operational risk refers to adversely affecting the environment, the use of natural resources, and climate change.</p>	<p>-Ensure that an assessment of potential adverse impacts has been made.</p> <p>-Ensure action plans are prepared to prevent or reduce potential adverse impacts.</p> <p>-Ensure that the actions defined in the action plan are registered and monitored.</p>	<p>-Number of penalties, fines, complaints, and their financial cost for adverse impacts.</p> <p>-Level of compliance with the action plan to guarantee data quality of impacts.</p>
<p>Reputational risk because of the potential adverse effects of the operations of the enterprise.</p>	<p>Ensure that there is a register of adverse impacts, incidents, and causalities together with remedial and follow-up actions to reverse the outcomes.</p>	<p>-Number of impacts, incidents, and causalities within a specified time frame.</p> <p>-Level of preparation of remedial action plan.</p> <p>Number of reversed impacts, incidents, and causalities within a specified time frame. .</p>

<p>Social risk operations within the enterprise that contradict the interests of the community.</p>	<p>Assess the initiatives to improve product and service efficiency that will benefit the community.</p>	<p>-Number of collaborations and studies with organizations that protect the best interest of the community.</p>
Strategy (management of natural resources, emissions, and waste management)		
<p>Risks</p>	<p>Audit and internal control approach</p>	<p>Indicators</p>
<p>Incorrect definition of potential scenarios in the implementation of a circular business model.</p>	<p>-Identify long-term scenarios used by the enterprises (i.e., in strategy, energy planning, investment or sustainability and risks areas) for transition into a circular business model.</p> <p>-Assess divergences between different scenarios and assess potential risks.</p>	<p>-Number of circulate business model scenarios considered. used.</p> <p>-Number of transition variables from a liner to a circular business model identified for monitoring.</p> <p>-Periodic review of the strategy plan and the degree of compliance with goals.</p>
Governance (management of natural resources, emissions, and waste management)		
<p>Risks</p>	<p>Audit and internal control approach</p>	<p>Indicators</p>
<p>Insufficient involvement of shareholders, board of directors, c steering committees in the implementation of a circular business model</p>	<p>-Communication channels, review procedures and documentation (presentations, dashboards, etc.) between high governing bodies on an enterprise. and SC (review of procedures) and characteristics of the communications (regular presentations, dashboards, sporadic communications, etc.).</p> <p>-Periodic formal reviews regarding procedures and measures required to switch into a circular business model.</p>	<p>-Number of annual reports dedicated to the circular business model that reach shareholders, the board of directors, and the steering committee.</p> <p>-Time dedicated by board members to review annual reports.</p> <p>-Number of effective decisions that will facilitate transitions into the circular model.</p>
Reporting (management of natural resources, emissions, and waste management)		

Risks	Audit and internal control approach	Indicators
Limited available Insufficient data related to circular economy, not aligned with regulatory requirements and insufficient for proper decision making.	<ul style="list-style-type: none"> -Verification of the relevant information and metrics regarding the circular economy to be used within the enterprise. -Regular recording and analysis of proper and adequate data. -Regular use of data in the decision-making governing bodies within the enterprise. 	<ul style="list-style-type: none"> -Number of internal data reports generated during a specific time frame. -Number of decisions facilitated through data analysis.

4. Conclusions and recommendations

The proposed instrument for audit and internal control is based on a conceptual framework that enterprises in Albania can undertake to make a transition from a linear into a circular business model. The proposed instrument and its corresponding indicators are the first steps to internal audit and controls procedures in Albanian enterprises. This model can be easily incorporated into the operations of Albanian enterprises on a step-by-step approach (OECD, 2019). The proposed model and corresponding indicators can be easily customized to the main activity of the enterprise depending on the industry they operate such as manufacturing, production, tourism, agriculture, food processing industry. The model can be revised, updated, and expanded with new indicators and actions based on national and European regulations (Bannier et al., 2019)

The objective of circular economy audit and internal control instrument aims to facilitate creation of the right innovation and entrepreneurial environment, so enterprises and their stakeholders can re-think their business. The objective of the piloting and implementation support is to strengthen the overall ability of enterprises to carry out the strategic actions on circular economy business development (Fishammar & Parida, 2019). The objective of performance evaluation is to understand the value of the circular economy efforts and continuously be able to evaluate the business case for the circular economy efforts. These efforts together with the proposed instrument for internal audit and controls support and facilitate transition into the circular business model making sure they are leveraged optimally.

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The Impact of Renewable Energy Consumption and Economic Growth on CO₂ Emissions: Evidence from OECD countries

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Abstract

One of the best solutions to achieve sustainable development goals (SDG) is diminishing the gap between carbon dioxide emissions and economic development. For a long time, the consumption of renewable energy has been presented as the optimum solution to reduce carbon dioxide emissions. Degradation of the environment as a result of CO₂ emissions and the key role of renewable energy on the environment and economic conditions are becoming one of the most discussed topics recently. Hence, the aim of this study is to explore the relationship between renewable energy consumption and economic growth on CO₂ emissions, using a dataset of 36 OECD countries over the period 1997-2019. The study was implemented via dynamic panel data estimation methods, using a fully modified ordinary least squares (FMOLS) technique for long-term parameters. The Pedroni estimator is employed for determining the probable presence of a long-run co-integrating relationship between variables in the panel data set. The results of the Pedroni co-integration test show that there exists a long-term balance relationship between CO₂ emission and its determinants. The results of the FMOLS method suggest that in the long run renewable energy can reduce carbon emissions, while higher overall economic growth can contribute to higher carbon emissions.

Keywords: CO₂ Emissions, Economic Growth, Renewable Energy Consumption, OECD Countries

Jel Code: Q3, Q4, Q5

Introduction

Nowadays is widely recognized that the increase of greenhouse gas emissions, primarily CO₂ emissions, from continuous economic progress, is a persistent challenge to the world and if drastic actions aren't taken to reduce global warming, the world could be heading toward environmental disaster. Therefore, agreements on climate change, like the Kyoto Protocol in 1997, Paris Agreement in 2015 (COP21), and United Nations Climate Change Conference at Marrakech 2016 (COP22) have coercive force, leading most of the OECD countries to set voluntary targets for the reduction of pollution from nonrenewable energy consumption and directing attention towards

alternative energy sources. The circular economy plays a vital role in society, boosting the non-linearity of the economy and decreasing the energy intensity required to satisfy the needs of the population. Without the proper involvement of world leaders and policymakers, the emissions associated with the burning of fossil fuels would increase significantly and it would become impossible to stop the negative consequences of environmental degradation.

A large part of energy economics literature has been interested in exploring the relationship between renewable and non-renewable energy consumption, environmental degradation, and economic growth, focusing on the environment-growth nexus through the validity of the Environmental Kuznets Curve (EKC) hypothesis, which was first introduced by Grossman and Krueger (1991). When an economy starts moving along the growth trajectory, in the early stages of economic growth, pollution emissions increase and environmental quality declines, but beyond a certain level of income per capita (which will vary according to various indicators), the trend is reversed, so that at high levels of income, economic growth leads to environmental improvement, implying that environmental impacts or emissions per capita are an inverted U-shaped function of income per capita (Stern, 2018).

This study aims to explore the relationship between renewable energy consumption and economic growth on CO₂ emissions, in the case of 36 OECD countries, over the period 1997-2019. We also examine the impact of trade openness and urbanization on carbon emissions, since these two variables are widely used in the environmental function in different studies (Martínez-Zarzoso and Maruotti, 2011; Abouie-Mehrizi et al., 2012; Yazdi and Shakouri, 2014; Shahbaz et al., 2016; Sun et al., 2019; Gu et al., 2013). The rest of this paper is organized as follows: Section 2 reviews the prior literature focused on the inter-linkage between economic growth, renewable energy, and carbon emissions. Section 3 presents the methodological framework for empirically analyzing the relationship between carbon emissions and their long-run determinants. Section 4 analyzes and discusses the obtained results from the model. Finally, the concluding remarks and the policy recommendations, which can be considered as action tools to combat the situation are reported in section 5.

Literature Review

Numerous studies explored the relationship between economic growth, renewable energy consumption, and CO₂ emissions since recently there has been an increased awareness of global warming and the climate changes that are taking place. Due to the use of different data, periods, and methodological approaches, the results of these papers do not have a consensus among them. Some of the studies have found unidirectional or bidirectional causality from renewable energy consumption and/or economic growth to carbon emissions. On the other hand, others have found no causality and/or bidirectional causality between renewable energy consumption and/or economic growth to carbon emissions.

Most studies concluded that an increase in renewable energy consumption decreases carbon emissions, while economic growth contributes to higher carbon emissions. Aydin (2013) investigated the relationship between carbon emissions, economic growth, renewable energy consumption, and population density in G7 countries for the period 1991–2009, using panel OLS, fixed effects, and random effects. The results of the study suggested that both renewable energy and population density lead to a decrease in carbon emissions, according to the cross-section random effect model. Ito (2017) using panel data from 42 developed countries over the period 2002–2011 examined the linkage between CO₂ emissions, renewable and non-renewable energy consumption, and economic growth. Applying the difference GMM estimator he found that renewable energy consumption contributes to reductions in CO₂ emissions, while economic growth and consumption of fossil fuel energy contribute to higher CO₂ emissions. Koengkan and Fuinhas (2017) examined the relationship between renewable energy consumption and CO₂ emissions, for 10 South American Countries over the period 1980–2012. Using the Auto-Regressive Distributed Lag (ARDL) methodology they concluded that in the short-run renewable energy consumption has the capacity to reduce CO₂ emissions, while GDP has a positive impact on carbon emissions, both in the short and long run. Shaari et al. (2020) also analyzed this relationship using a sample of high-income, upper-middle-income, and lower middle -income, and low-income countries for the period of 1990–2017, and the ARDL panel estimation method. Their results showed that renewable energy consumption can reduce CO₂ emissions in the long run, while economic growth and population growth can result in higher CO₂ emissions. In the short run, economic growth can contribute to higher carbon emissions, while higher population growth and higher renewable energy consumption can help reduce carbon emissions.

The results of some other studies are inconclusive regarding the relationship between renewable energy and carbon emissions. Menyah and Rufael (2010) explored the relationship between carbon dioxide emissions, renewable, and nuclear energy consumption, and real GDP for the US countries for the period 1960–2007. By applying a modified version of the Granger causality test, they found a unidirectional causality going from nuclear energy to CO₂ emissions, but they couldn't find a relationship between renewable energy and CO₂ emissions. Jebli and Youssef (2015) using panel OLS, FMOLS, and DOLS techniques, examined the link between renewable energy consumption, agricultural value added, carbon dioxide emissions, and GDP for five North African countries for the period 1980–2011. In the long run, the results showed that an increase in renewable energy and economic growth can result in higher carbon emissions, while the Granger causality test showed a bidirectional causality between agriculture and CO₂ emissions, a unidirectional causality running from renewable energy to both agriculture and carbon emissions, and a unidirectional causality running from GDP to both agriculture and carbon emissions. Saidi and Omri (2020) studied the impact of renewable energy consumption on both economic growth and CO₂ emissions for 15 major renewable energy-consuming countries, over the period 1990–2014 using FMOLS and VECM estimation techniques. Their results showed that there is a bidirectional relationship between economic growth and carbon emissions in the both short- and long-run. However, they couldn't find a causal relationship between CO₂ emissions and renewable energy in the long run but found bidirectional causality between CO₂ emissions and renewable energy in the short run.

A considerable number of studies have analyzed the impact of renewable energy consumption and economic growth on carbon emissions, through the validity of the Environmental Kuznets Curve (EKC) hypothesis. Bilgili et al. (2016) investigated the plausibility of the EKC hypothesis for carbon dioxide emissions within the framework of renewable energy consumption, for 17 OECD countries for the period 1977-2010. Using panel FMOLS and DOLS estimation techniques, their findings support the EKC hypothesis, indicating that GDP per capita has a positive impact on CO₂ emissions and GDP per capita squared has a negative impact on CO₂ emissions, while renewable energy consumption has a negative impact on CO₂ emissions. Alam et al. (2016) examined the impact of income, energy consumption and population growth on carbon emissions by employing the ARDL approach for the period 1970–2012 for India, Indonesia, China, and Brazil. They concluded that carbon emissions have increased with increased income and energy consumption in all four countries and they demonstrated that CO₂ emissions will decrease over time when income increases, supporting the environmental Kuznets curve (EKC) hypothesis. Sinha and Shahabaz (2017) also analyzed the impact of renewable energy and economic growth on CO₂ emissions, employing the ARDL approach, for India over the period 1971-2015. They concluded that economic growth increases carbon emissions in the early stages, and then it can reduce CO₂ emissions in the final stages, supporting the Environmental Kuznets Curve, while renewable energy reduced CO₂ emissions for India. Zaghdoudi (2017) investigated the relationship between oil prices, renewable energy, carbon dioxide emissions, and economic growth for the OECD countries over the period 1990-2015, using panel FMOLS and DOLS methods. The results showed that oil prices and renewable energy have a negative impact on CO₂ emissions in the long run. This study also confirmed the existence of EKC for OECD countries, showing a positive sign of economic growth and a negative sign of the quadratic term of economic growth. The results of Granger's causality test reveal the presence of both short-run and long-run bidirectional causality between oil prices and CO₂ emissions.

Tools and methodology

In this study, we use data for 36 countries from OECD over the 1997-2019 period. All variables are sourced from the World Bank Development Indicators (WDI) database. The 36 OECD countries used in the sample include Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland Ireland, Israel, Italy, Japan, South Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States. The variables are CO₂ emissions (CE) measured in metric tons per capita, GDP per capita (Y) measured in constant 2015 US\$, renewable energy consumption (RE) measured as the share of renewable energy in total final energy consumption, trade openness (OPEN) measured as a percentage of export and import values as a share of GDP, and urbanization (URBPOP) measured as the percentage of urban population as a share of the total population.

Table 1 presents the descriptive statistics and correlation matrix for the variables. One notes that the mean statistics of GDP per capita (lnGDP) are greater than those of carbon emissions (lnCE) and renewable energy consumption (lnRE) and that the mean, maximum and minimum values of lnCE and lnRE are close to each other in comparison with related statistics of other variables. From the correlation matrix we can notice that carbon emissions are positively correlated with lnGDP, lnGDP², lnURBPOP and lnOPEN, but negatively correlated with lnRE.

Table 1. Descriptive statistics and correlation matrix

<i>Descriptive statistics</i>	<i>lnCE</i>	<i>lnGDP</i>	<i>lnGDP²</i>	<i>lnRE</i>	<i>lnOPEN</i>	<i>lnURBPOP</i>
Mean	2.038	10.227	105.066	2.499	4.390	4.322
Std. Dev	0.455	0.687	13.899	0.973	0.514	0.154
Min	1.074	8.642	74.697	-0.390	2.897	3.925
Max	3.242	11.629	135.256	4.395	5.840	4.585
Observations	828	828	828	828	828	828
Correlation matrix						
LnCE	1.000					
lnGDP	0.533	1.000				
lnGDP ²	0.529	0.999	1.000			
lnRE	-0.406	-0.004	-0.001	1.000		
lnOPEN	0.005	0.039	0.048	0.037	1.000	
lnURBPOP	0.241	0.449	0.449	-0.063	-0.228	1.000

To find the relationship between carbon emissions, renewable energy, economic growth, urban population, and trade openness we estimate the following model which describes the Environmental Kuznets Curve (EKC):

$$CE_t = f(Y_t, Y_t^2, RE_t, OPEN_t, URBPOP_t) \quad (1)$$

In Eq. (1), CE, Y, Y², RE, OPEN, and URBPOP stand for CO₂ emissions, GDP per capita, GDP per capita squared, renewable energy, trade openness, and urbanization, respectively.

Considering the logarithmic form of it, since it gives more efficient results and avoids the problems associated with dynamic properties of the data series we can write:

$$\text{LnCE}_{it} = \beta_0 + \beta_1 \text{LnY}_{it} + \beta_2 \text{LnY}_{it}^2 + \beta_3 \text{LnRE}_{it} + \beta_4 \text{LnOPEN}_{it} + \beta_5 \text{LnURBPOP}_{it} + \varepsilon_{it} \quad (2)$$

where i is the country, t is the period, and ε_{it} is the error term. The parameters $\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 represent the long-run elasticity estimates of $Y, Y^2, RE, OPEN,$ and $URBPOP,$ respectively. For validity, the EKC theory requires β_1 to be positive and significant while β_2 has to be negative and significant.

The econometric approach is based on three steps. First, we follow the panel unit root test, in order to determine whether the series are stationary or not and to ensure the robustness of our components. The Levin Lin and Chu (LLC) test we will use, is conducted by Equation (3):

$$\Delta y_{it} = \rho y_{it-1} + \sum_{L=1}^{pi} \theta_{iL} \Delta y_{it-L} + \alpha_{mi} d_{mt} + \varepsilon_{it}, \quad m = 1,2,3 \quad (3)$$

where Δ, α_{mi} and d_{mt} represent first difference operator, corresponding vector of coefficients and vector of deterministic variables respectively, while ε_{it} is uncorrelated throughout the units and follows an ARMA process. We test the null hypothesis $H_0: \rho=0$ against the alternative hypothesis $H_a: \rho < 0$. When the null hypothesis is rejected, it is determined that the series are stationary.

In the second step, if the results don't indicate the stationarity process of the panel, we check the cointegration relationship between the variables. Pedroni (1999, 2004) offers an extension if the cointegration relationships include more than two variables and develops seven tests statistics, grouped into two categories: group-mean statistics that average the results of individual country test statistics and panel statistics that pool the statistics along the within-dimension. There are four statistics within dimension method, namely, a panel v -statistical, panel ρ -statistical, panel PP statistical and panel ADF-statistical, while on the between dimension method, there are three statistics (group ρ -statistic, group PP-statistic and group ADF-statistic). We test the null hypothesis of no cointegration against the alternative hypothesis that suggests a co-integration relationship exists between the variables in the long run.

After determining the cointegration relationship, the last step is to estimate the cointegration coefficients by employing panel fully modified ordinary least squares (FMOLS) methods developed by Pedroni. The fully modified OLS (FMOLS) technique allows for taking into account the heterogeneity in the cointegration relationship, generating consistent estimation of the parameters. It also corrects the endogeneity of the explanatory variables and the serial connection inherent in the dynamic panels (Pedroni, 2000).

Results and discussion

LLC (Levin, Lin, and Chu) panel unit root test has been applied to carbon emissions, GDP, GDP², Renewable Energy, Trade Openness, and Urbanization in both levels and first differences. The results of the panel unit root test are provided in Table 2.

Table 2. LLC panel unit root test

<i>Variable</i>	<i>I(1)</i>
CE	3.84
ΔCE	-9.88***
GDP	-6.98***
ΔGDP	-10.80***
GDP ²	-6.58***
ΔGDP ²	-10.89***
RE	-0.84
ΔRE	-10.25***
OPEN	-3.82***
ΔOPEN	-15.73***
URBPOP	-1.47*
ΔURBPOP	-6.86***

Note: ***, **, * indicate the rejection of null hypothesis of unit root at 1%, 5% and 10% significance levels, respectively.

It can be noted that the results of the panel unit root test are mixed, especially for GDP, GDP², trade openness, and urbanization, where the LLC test indicates stationarity in both levels in the first differences, while CO₂ emissions and renewable energy consumption are stable only at the first differences. However, the empirical results reported in Table.2 reveal that all the variables are stationary at the first difference at the 1% level of significance, indicating a rejection of the null hypothesis.

Table 3 shows the results of the panel cointegration test. The results reported in Table 3 provide strong evidence for panel cointegration among the variables, since all seven test statistics confirm the presence of a co-integration relationship among lnCE, lnGDP, lnGDP², lnRE, lnOPEN, and

lnURBPOP, rejecting the null hypothesis of no cointegration. It is concluded that a balanced relationship in the long term between the variables seems possible.

Table 3. Pedroni panel co-integration test results

	<i>Statistic</i>	<i>Probability</i>
Within dimensions (common AR coefficients)		
Panel v-statistic	-3.632***	0.000
Panel rho-statistic	1.474*	0.070
Panel PP-statistic	-5.406***	0.000
Panel ADF-statistic	-5.135***	0.000
Between dimensions (individual AR coefficients)		
Group rho-statistic	3.452***	0.000
Group PP-statistic	-5.785***	0.000
Group ADF-statistic	-5.303***	0.000

Note: ***, **, * indicate the rejection of the null hypothesis of the panel cointegration test at 1%, 5% and 10% significance levels, respectively.

Newey-West Bandwidth selection with Bartlett Kernel is used.

In addition, the long-term output elasticities are estimated, using panel fully modified OLS (FMOLS) technique. The estimation results of the environmental function are presented in Table 4. As we can see, the coefficients of ln GDP and of ln GDP² yield positive and negative estimators, respectively, on carbon emissions (CE) for the OECD countries, concluding that the EKC happens for our panel sample. The results indicate that a 1% increase in GDP per capita increases carbon emissions by 2.72%, while a 1% increase in GDP per capita squared decreases carbon emissions by 0.11%, confirming the inverse U-shaped relationship between CO₂ emissions and economic growth. The results also suggest that renewable energy consumption has a negative and significant impact on carbon emissions, where a 1% increase in renewable energy consumption decreases carbon emissions by 0.14%. Contrary to the effect of renewable energy, trade openness and urbanization increase carbon emissions in OECD countries. Findings show that an increase of 1% in trade openness and urbanization will increase carbon emissions by 0.05% and 0.20%, respectively and both coefficients are statistically significant at 5% level.

Table 4. Panel data analysis for OECD Countries (1997-2019)

<i>Variable</i>	<i>Panel FMOLS</i>	
lnGDP	2.722***	0.000
lnGDP ²	-0.117***	0.000
lnRE	-0.146***	0.000
lnOPEN	0.058**	0.021
lnURBPOP	0.205**	0.011

Note: ***, **, * indicate the significance level at 1%, 5% and 10%, respectively.

Conclusions and recommendations

This paper explores the relationship between renewable energy, economic growth, trade openness, urbanization, and carbon emissions for 36 OECD countries following annual data from 1997 to 2019, using panel FMOLS estimation techniques. After conducting the panel unit root test, the results of our analysis showed that the series are stationary at the first differences and between the variables exists a long-run equilibrium relationship by Pedroni co-integration test. The findings of the FMOLS method suggest that the positive sign of economic growth and the negative sign of the quadratic term of economic growth on CO₂ emissions confirm the existence of the Environmental Kuznets Curve for OECD countries in our sample. The empirical results also show the efficiency of renewable energy consumption in reducing carbon emissions, while trade openness and urbanization contribute to higher CO₂ emissions.

Policymakers in their efforts to promote economic growth should take into account the shift from fossil fuels-based economies into low-carbon economies, in order to mitigate environmental degradation. In the first instance, governments should take serious initiatives toward transforming the energy structure by substituting nonrenewable energy for renewable energy such as hydropower, wind, and solar. To encourage investment in the renewable energy sector, policymakers should follow subsidies for low-emitting energy sources, tax incentives for energy policy, feed-in tariffs and green certificates trading, investment grant policies and investment subsidies. By implementing these policies, OECD countries not only will reduce the dependency on non-renewable energy sources, but will also contribute to preventing global warming. These policies will also stimulate private investors to engage more actively in the area of renewable energy activity by encouraging more Public- Private Partnership (PPP) initiatives and identifying barriers to increasing investments in renewable energies.

6. References

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Are our unlimited desires destroying the environment: An empirical analyze for the Albanian economy

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Abstract

Consumption processes based on production using raw materials from natural resources have irreparable effects on the environment and therefore on the economic and social life of every human being. In a globalized world with people's unlimited desires on the one hand and limited production possibilities on the other, it is essential to protect the environment both in terms of the use of natural resources and from the waste that goes as disposal, which are becoming the main problem in the whole world. Economic development and economic activities of the contemporary world are being threatened by the total amount of non-collected waste, especially in the rural areas, and of the amount of waste not being treated.

This paper aims to study theoretical and practical aspects of the relation between economic development, waste production and environmental pollution having in focus the benefits coming out from alternative economy model. A deep analyze of theoretical models that shows the relation between sustainable development, country stage of development and environmental degradation will take place. In this regard different models that treat the relation between specific environmental pollutants such as CO₂, and development indicator as GDP per capita and waste produced by human activity will be analyzed. Regression model will be used to evaluate the relationship that exists between CO₂ emissions, economic growth and waste with a specific focus in the Albanian economy.

Keywords: Consumption, Waste, Pollution, Environment, Sustainable Development

Jel Code: E21, O11, O40, Q01, Q53, Q56,

1. Introduction

Demand for natural resources worldwide has increased tremendously over recent decades. The main drivers have been growth in population, wealth and consumption, with high population growth mainly in developing countries and highest levels of wealth and consumption in developed countries.

The world population reached 8 billion on November 15, 2022, which means that the population grew by one million in only 11 years [1]. Dating back to 1804, when the population marked only 1 million inhabitants, it took 123 years for the population to double. Then it took 33 and 14 years, respectively, for the population to reach 3 and 4 million inhabitants in 1974. The increase of 1 million inhabitants has always happened in shorter periods of time. But even more worrying is the fact that for the same periods of time, the growth of consumption has been higher than the growth of the population. Thus, starting from 1974 to 1987, the population increased by 25%, while consumption (measured in constant 2015 US\$) increased by 50%. In the following two 12-year periods, the population increased by 20% and 17%, respectively, while consumption increased by 44% and 42% until 2011, thus, with an increase of more than double of that of the population. Meanwhile, even starting from this year, consumption has increased more than the population, where only for the period until 2020, consumption has increased by 19% worldwide. Increase of GDP measured in constant US\$ compared to the increase of population indicates that the world is consuming more than it really needs, showing to have unlimited desires.⁴²

By 2050, the world is expected to generate 3.40 billion tons of waste annually, increasing drastically from today's 2.01 billion tons per year if we continue the same steps. Population increase may be part of the problem, but it is levels of consumption within a handful of developed nations, and their gross mismanagement of waste, that have led to this environmental catastrophe [2]. Both consumption and waste have major environmental impacts. Producing goods and transporting them to consumers uses large quantities of fossil fuels and produces pollution, particularly carbon dioxide (CO₂). When these products become waste, they are transported again—usually to landfills, where they produce methane (another potent greenhouse gas) as they break down—or to incinerators, which generate more pollution as they burn [3].

However, as the Global Waste Index highlights, it's not just the generation of waste that will threaten our planet in the upcoming decades – but the way we choose to manage it. Recycling, the process of converting rubbish into new materials, is the best method for managing waste; while incineration, the process of controlled combustion used to turn waste into energy, is considered far more favorable than landfill sites and illegal dumping [4].

⁴² Calculations are made by authors, based on World Bank Data (2022)

Albania was granted EU candidate status in 2014. As part of its process towards EU integration, it is working to align its environmental standards to those of the EU. As such, 2020 saw Albania reach mid-level transposition progress of 48 per cent for Chapter 27 of the EU acquis, which is titled “Environment and Climate Change”. Albania processed approximately one million tons of household waste in 2019. Some 78 per cent of this was treated in landfills and disposed of with varying degrees of environmental control. About 19% were segregated for recycling. Organic waste, which is about 50 per cent of disposed waste, leads to methane generation, a potent greenhouse gas. Landfill gases and leachate pollute both water and soil, endangering agriculture and drinking water supplies. Albania’s waste-management practices are still dominated by a linear collect-and-dispose approach instead of integrated sustainable waste-management. However, the recently adopted National Waste Management Strategy (2020 – 2035) has developed a roadmap towards integrating the principles of the circular economy and extended producer responsibility. The concept of the polluter-pays principle is not currently well developed in Albania and the costs of providing a basic minimum standard of waste disposal are recovered in only a few cities [5].

Taking in consideration that our unlimited desires are generating more and more waste, it is tried to estimate if this is destroying the environment for the case of Albania, or not, indicated by CO₂ emissions as the major greenhouse gas leading to climate change.

2. Literature Review

As cited by EEA, the consumption of goods and services in developed countries is a major driver of global resource use and associated environmental impacts. Consumption is shaped by an array of complex, interrelated factors such as demographics, income and prices, technology, trade, policies and infrastructure, as well as social, cultural and psychological factors. Production activities across economic sectors, including extractive industries, agriculture, energy, transport and manufacturing, are directly responsible for the majority of the environmental impacts caused by the economy. However, it is private and public consumption that are the fundamental causal factors and drivers of change in production activities. Consumption leads to the direct creation of environmental pressures from the use of products and services, for example, through driving a car or heating a house with fossil fuels. Of greater magnitude, however, are the indirect pressures that are created along the production chains of the goods and services consumed, including, for example, food, clothing, furniture, or electricity. Both direct and indirect pressures result in environmental impacts, in particular global warming, biodiversity degradation, soil sealing and air and water pollution [6].

As reported in European Commission, the focus of EU environmental policies on sustainable consumption and production has gradually evolved over recent decades from a focus mainly on cleaner production, through sustainable products to a more holistic approach to sustainable consumption and production. In the context of developing a modernized and sustainable economy, in December 2015, the EU Commission introduced the Circular Economy Package, which defines economy as ‘where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste is minimized’. The transformation from a linear economy based on the ‘take-make-dispose’ approach towards circular economy allows for a more ecological use of natural resources, low carbon emission, energy saving, and environmental protection, considering that natural resources are depleting at a fast pace with the world population increasing rapidly [7].

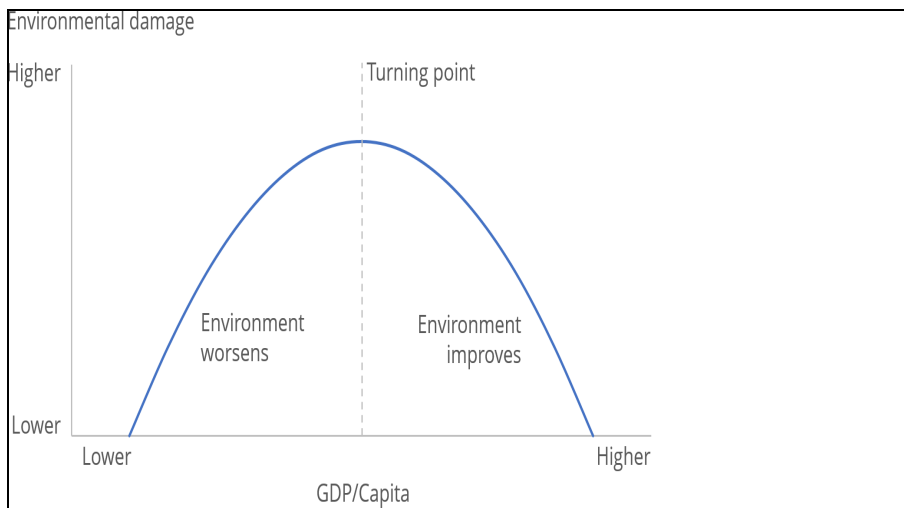
According to OECD, good waste management systems are essential to building a circular economy, where products are designed and optimized for reuse and recycling. As national and local governments embrace the circular economy, smart and sustainable ways to manage waste will help promote efficient economic growth while minimizing environmental impact [8]. Solid waste management is critical for sustainable, healthy, and inclusive cities and communities, yet it is often overlooked, particularly in low-income countries. While more than one-third of waste in high-income countries is recovered through recycling and composting, only 4% of waste in low-income countries is recycled. Based on the volume of waste generated, its composition, and how the waste is being managed, it is estimated that 1.6 billion tons of CO₂ equivalent were generated from the treatment and disposal of waste in 2016 – representing about 5% of global emissions [2].

Regarding Albania, as cited in Co-Plan and EnvNet Report of 2018, recent developments in the waste management sector have been focused on the implementation of legal acts and on the improvement of strategic documents. The National Waste Management Strategy 2018-2033 aims to establish a minimum standard on waste management in the country's territory and establish a unified methodology to evaluate the costs related to the provision of the integrated waste management service. The adoption of the National Integrated Waste Management Strategy and its implementation is assessed as a key step in improving the waste management situation in the country. In general, the situation of integrated waste management in the country appears to be extremely problematic. Currently, about 69% of the population receives waste management services; only 30% of waste is dispatched to the landfill, while the rest are disposed on inadequate deposit sites. Regarding the infrastructure and type of landfills, there are no landfills designed to meet EU standards. Most of the waste is deposited on local and illegal landfills. Meanwhile, three incinerators are being built in the Municipality of Tirana, Elbasan and Fier. Recycling companies in the country have reduced processing capacities, and in 2019 about 38 companies recycled 4.5% of the total amount of waste, and their number and processing capacity is now somewhat unclear [9].

As environmental and economic sustainability, put together, have become the focus of economists and policy makers, especially in recent decades, there are many debates regarding their relationship. The relationship between environmental degradation and per capita income for instance, is theoretically and empirically being investigated for more than three decades now. The Environmental Kuznets Curve (EKC) is one of the most prevalent methods to analyze environmental performance and it is based on an inverted U-shaped curve created by Kuznets in 1955 [10]. Grossman and Krueger (1991) were the first to build the theory of the link between economic growth and environmental degradation, proving that their relationship is not constant through the course of a country and the first to prove the existence of the EKC. They first tested the existence of this inverted U-shaped Environmental Kuznets Curve (EKC) on pollutants such as sulfur dioxide (SO₂) and smog, and later, on other pollutants, such as CO₂. [11]

The logic of the EKC relationship is that in early stages of industrialization, pollution grows rapidly because high priority is given to increasing material output, and people are more interested in income than environment. In the later stage, however, as income rises, the willingness to pay for a clean environment increases by a greater proportion than income, regulatory institutions become more effective for the environment, and pollution level starts declining [12]. The inverted-U relationship reveals that economic growth could be compatible with environmental improvement. To determine the differences between income and environmental degradation, they define three main effects - technical, scale and composition effect [13]. The EKC is depicted graphically in Figure 1 [14].

Figure 1: The Environmental Kuznets Curve



Source: Syed, A (2019)

Mostly and initially the EKC is tested for group of countries together using panel data analyzes, as per OECD and non-OECD countries [15] group of countries such as China, Korea and Japan [16], Balkan Countries [17]. But on the recent years, there is an increasing trend for analyzes for individual countries. Thus we can mention testing on CO₂ for the case of Germany [18], on SO₂ for Spain [19], on CO₂ for UK [14], on CO₂ for Brazil [20], etc. For the case of Albania, analyzed as an individual country, there is no study made that proves the existence of the EKC. Thus, in this paper it is questioned the relationship between CO₂ emissions, GDP per capita, and waste estimated by a quadratic function.

3. Tools and Methodology

The methodology used in the analyze of this study is based on quantitative indicators and the data used are at the macroeconomic level. Annual data are collected from the World Bank and INSTAT for the case of Albania during the period 2000-2019 and published in 2022. Data include CO₂ emissions (*CO₂*) measured in metric kg per capita; GDP, measured as GDP per capita (*GDP/cap*) and (*GDP*)² per capita [*(GDP)²/cap*] and waste measured in metric kg per capita (*Waste/cap*).

Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring. GDP is converted to (constant 2017) international dollars using purchasing power parity rates. Waste constitutes the theoretical total amount of waste generated/produced by human activity in the respective year. This indicator refers to the waste managed in areas where this activity is carried out as a public service to the community and the quantity of waste managed by the residents because waste treatment is not provided by public services. The total amount of generated waste in this case comes as the theoretical calculation of the total waste generated by residents based on the managed waste indicator per resident per year and the extent of coverage of residents with waste services in the relevant year

Depending on the availability of data, these latter have been collected to get the maximum number of observations and were converted into natural logarithms prior to conducting the empirical analyze. As data on waste for Albania are available starting only from 2013 to 2021, the time series is back casted to 2000' using moving average method. Since the administrative territorial reform implemented in Albania in 2015 brought an increase in the efficiency of waste collection, the value of waste for this year in the time series has been adjusted. All estimates were made using Stata 15.0 software. The econometric model used is the OLS (Ordinary Least Squares) model, which makes it possible to evaluate the explanation of the dependent variable by other independent variables for a certain period under the fulfillment of some assumptions certain, tested these through statistical tests. More specifically, the statistical tests used in this analyze are the test of heteroskedasticity, normality, partial correlation, and multicollinearity. The time series used in this analyze for *lCO₂*, *lGDP/cap* and *l(GDP)²/cap* have unit roots, therefore first differences of these series are made to make them stationary (indicated by the symbol *d*).

Regarding the conceptualization of the model that will be used for the empirical analyze and based on the up-mentioned methodology, the econometric model designed to be evaluated is:

$$dICO_2 = C + \beta_1 * dGDP/cap + \beta_2 * dl(GDP)^2/cap + \beta_3 * lWaste/cap + \mu \tag{E1}$$

4. Results

Figures 2-4 present some graphical representations of the analyze’s variables to better understand their trends. According to these plots, GDP per capita shows an increasing trend, and so does the CO₂ emissions per capita. Regarding the waste produced by human activity, it results that the percentage of waste being managed to the total of generated waste has been increasing on the last years and that managed waste of typical household waste makes up a larger weight compared to industrial waste during this period.

Figure 2: GDP (constant 2017 international thousand \$ PPP) per capita and CO₂ emissions (metric tons per capita)

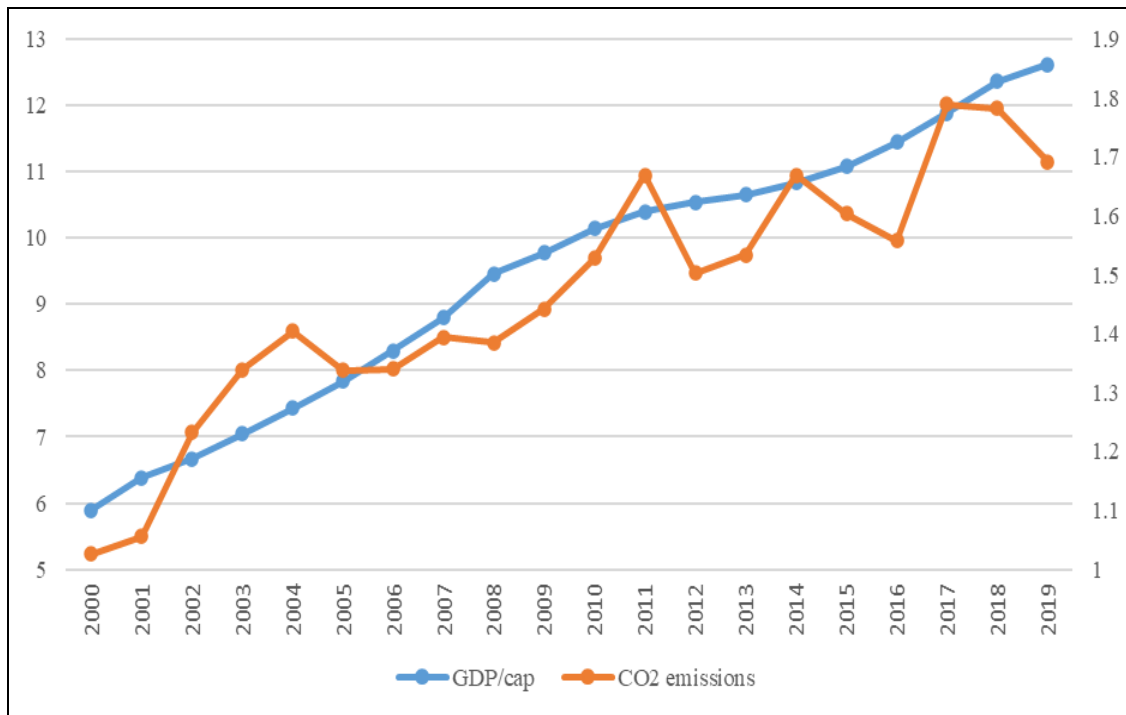
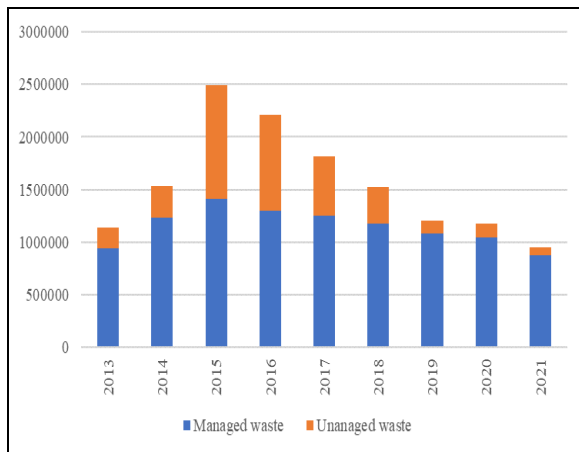
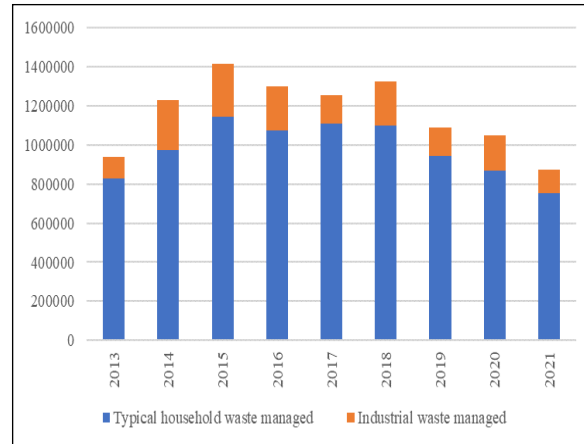


Figure 3: Total waste and managed (tons)

Figure 4: Managed waste (tons)



Source: INSTAT (2022)



Source: INSTAT (2022)

The econometric analyze of the data gathered for the Albanian economy resulted in the below described model:

$$dICO_2 = -1.408 + 0.888 * dIGDP/cap - 0.582 * dl(GDP)^2/cap + 0.228 * IWaste/cap$$

E2

In overall it results that the model has an R-squared of 0.4731, which means that 47.31% of the variance in the CO_2 variable is explained by the independent variables included in this regression, as well it also results that the model is jointly statistically significant referring to the value $F=4.49$ (p-value=0.0194). The model is jointly statistically significant with a 95% confidence interval and the regression also shows that each of the independent variables explains statistically significantly CO_2 emissions in Albania.

The empirical model has successfully passed the diagnostic tests. Based on the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity, it turns out that the residuals of the model are homoscedastic, or that the assumption of consistency of coefficients for the estimated OLS regression is met. Regarding the normality test, the histogram shows for a normal distribution of the residuals and as well, Jarque-Bera test shows that the assumption of normality of residuals to have consistent regression coefficients is met. Based on the significance values of the partial and semi-partial correlations of CO_2 emissions with other independent variables, it results that there

are statistically significant relationships between CO₂ emissions and any other variable in the model individually, while controlling for a third variable associated with them. The estimated model does not suffer from the presence of multicollinearity between independent variables, thus fulfilling the assumption of consistency of coefficients for the OLS regression, excepting the *GDP/cap* and $(GDP)^2/cap$, as the second variable is a deterministic non-linear function of the first one.

The sign of the coefficients derived from the evaluation of the model for the quadratic function proves the inverted U-shaped graph, indicating that with the increase in GDP/cap up to a certain point, the environment is negatively affected due to the increase in CO₂ emissions and after that point the quality of the environment starts to improve.

The outputs of the empirical model itself and of the diagnostic testing are attached at the Appendix at the end of the paper.

5. Conclusions and Recommendations

The results of the empirical analyze for the case of Albania for the period 2000-2019 validate the existence of the Environmental Kuznets Curve. Thus, the economic growth for the policymakers and the compliance of the unlimited desires for the population should not be their only focus. Making production and consumption more safe and ecologically friendly is crucial for a sustainable economic development. The government, for instance, may impose stricter environmental regulations that target both consumers and firms and the people themselves should be encouraged and aware on the products they consume aiming to avoid and even eliminate environmental degradation.

Considering the importance of circular economy on the environment, the local and central governance should undertake active policies in direction of increasing the collected waste and most important, in direction of their treatment, even though the waste management in Albania seems to be improved in the recent years. Waste management should be considered a strategic policy to raise the environmental quality in the country. The degree of monitoring and reporting for the types of pollutants should be increased and the monitoring network should be unified with that of the European Union countries.

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Appendix

In this Appendix are attached the outputs of the empirical model and of the diagnostic tests, resulting from the regression of the variables using Stata 15.0 software.

Table A1: The output resulting from the regression estimation

Source	SS	df	MS	Number of obs = 19
Model	.037999525	3	.012666508	F(3, 15) = 4.49
				Prob > F = 0.0194
Residual	.042322403	15	.002821494	R-squared = 0.4731
				Adj R-squared = 0.3677
Total	.080321927	18	.004462329	Root MSE = .05312

dlCO ₂	Coef	Std.Err.	t	P> t	[95% Conf. Interval]	
dlGDP	.8876446*	.4654623	1.91	0.076	-.1044649	1.879754
dl(GDP) ² /cap	-.5820162*	.2796891	-2.08	0.055	-1.178159	.014127
lWaste/cap	.2279661**	.0984742	2.31	0.035	.0180733	.4378589
_cons	-1.407923**	.5987544	-2.35	0.033	-2.684138	-.1317083

Note: *, **, *** indicate statistical significance at the 10%, 5%, and 1% level, respectively

Table A2: The output resulting from the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Variables: fitted values of dlCO ₂
chi2(1) = 0.88
Prob > chi2 = 0.7746

Figure A1: The histogram of the residuals

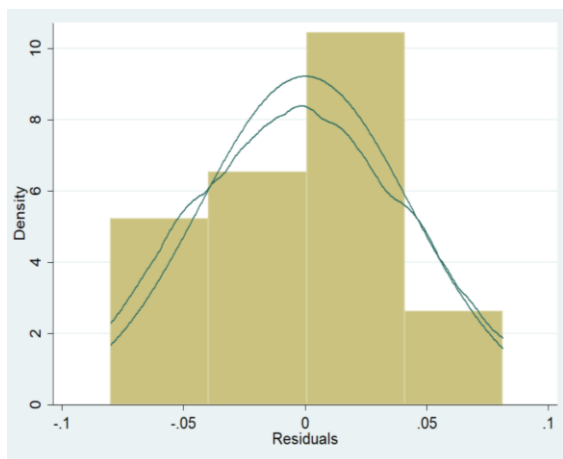


Table A3: The output resulting from the partial correlation test

Variable	Partial Corr.	Semipartial Corr.	Partial Corr.^2	Semipartial Corr.^2	Significance Value
dlGDP	0.4417	0.3574	0.1951	0.1277	0.0759
dl(GDP)²/cap	-0.4733	-0.3900	0.2240	0.1521	0.0550
IWaste/cap	0.5133	0.4339	0.2632	0.1883	0.0352

Table A4: The output resulting from the Pearson correlation coefficients of multicollinearity test

	dlCO₂	dlGDP/cap	dl(GDP)²/cap	dlWaste/cap
dlCO₂	1.0			
dlGDP/cap	-0.1336	1.0		
dl(GDP)²/cap	-0.2443	0.9754	1.0	
dlWaste/cap	0.5558	-0.0431	-0.0978	1.0

Table A5: The output resulting from the Variance Inflation Factor method of multicollinearity test

Variable	VIF	1 / VIF
dlGDP/cap	21.97	0.045523
dl(GDP)²/cap	21.80	0.045878
dlWaste/cap	1.07	0.934151

Mean VIF	14.94
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Challenges of financial reporting in circular economy

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Abstract

Circular Economy is a new approach created in the last twenty years towards the sustainability behaviour of companies in order to reduce climate change effects. The circular economy is completely different from the traditional economy. It changes the traditional economic development model of “resources-products-waste” to close the material cycle model of “resources-products-renewable resources”. In this article, we have tried to give a review of circular accounting and which can be the reporting principles and procedures for publishing progress on circularity. For more, we want to give an approach to circular accounting, which can be the reporting principles and procedures for publishing progress on circularity. In this context, this article aims to review the literature and policies related to challenges that accounting faces to report circular economy. According to the accounting information provided by the company, the government can understand the company's investment in environmental pollution control and renewable resource recovery; therefore, they can use this to formulate macroeconomic policies to punish or encourage enterprises. Hence, multiple accounting methods should be introduced into the accounting system and in accounting professional education. At the international level, several regulations concerning sustainability reporting are currently being revised, including the recent European adoption of the Corporate Sustainability Reporting Directive (CSRD). At the national level, new regulations and laws should be adopted in order to provide the conditions for a domestic company to operate in similar conditions as abroad. The recommendations are addressed to the proper institutions to achieve the right goals.

Keywords: Financial reporting, Circular Economy, Non-financial reporting

Jel Code: M41

Introduction

The information users of traditional accounting are mainly enterprise investors and creditors; while the main users of environmental accounting information in the circular economy, include not only business owners and stakeholders, but as well relevant government departments, especially the environmental protection and tax inspection department. According to the accounting information provided by the company, the government can understand the company's investment in environmental pollution control and renewable resource recovery; therefore, they can use this to formulate macroeconomic policies to punish or encourage enterprises. From another perspective of development, the existence and development of enterprises also need resources from the natural environment, because the expansion and development of the enterprise require natural resources as a support, while at the same time discharging the generated waste into the environment, if there are no lasting and stable nature resources as the material basis of the environment, it is impossible for enterprises to achieve long-term existence and stable development. Methods of Accounting Information Disclosure that combine monetary measure and non-monetary measures will provide more integral and accurate information.

The circular economy (Figure 1) is completely different from the traditional economy. It changes the open material cycle, that is, the traditional economic development model of “resources-products-waste”, to close the material cycle, that is, the innovative development model of “resources-products-renewable resources”. The theory of circular economy is the presupposition and basis of the establishment and development of environmental accounting. The accounting in circular economy is based on the long-term co-existence and mutual. Specifically, the current contents of accounting professional education does not bring up natural and renewable resources as assets, does not confirm social responsibility, safety production responsibility and environmental protection responsibility as corporate liabilities. The traditional accounting methods cannot accommodate the development of circular economy, so it is necessary to reform in the accounting methods. The social substances are multiple, if only one accounting method is used, the accounting will be bogged down. Hence, multiple accounting methods should be introduced into accounting system and in accounting professional education. Firstly, it is necessary to construct an effective special resource cost control system and a feasible overall budget for the enterprise with reasonable resource prices, strict energy-saving standards, timely differential analysis and other links to achieve effective cost management. Secondly, with the development of network and computer technology, artificial intelligence and big data technology in resource recycling are introduced into accounting information system and cost management system. These artificial intelligence and big data technologies will help managers on analyzing and controlling resource cost, saving energy, reducing consumption, and achieving the goal of improving the efficiency of resource utilization. In addition, the cost of individual special enterprises must also be included in the cost control system. For example, the resources consumed by enterprises in high-dangerous industries to prevent production accidents should be listed as safety costs [6]. All the above-mentioned innovative aspects of cost should be reflected in the professional education of various accountants. Therefore, these innovative contents above-mentioned by this paper should be reflected in the accounting professional education of various accountants.

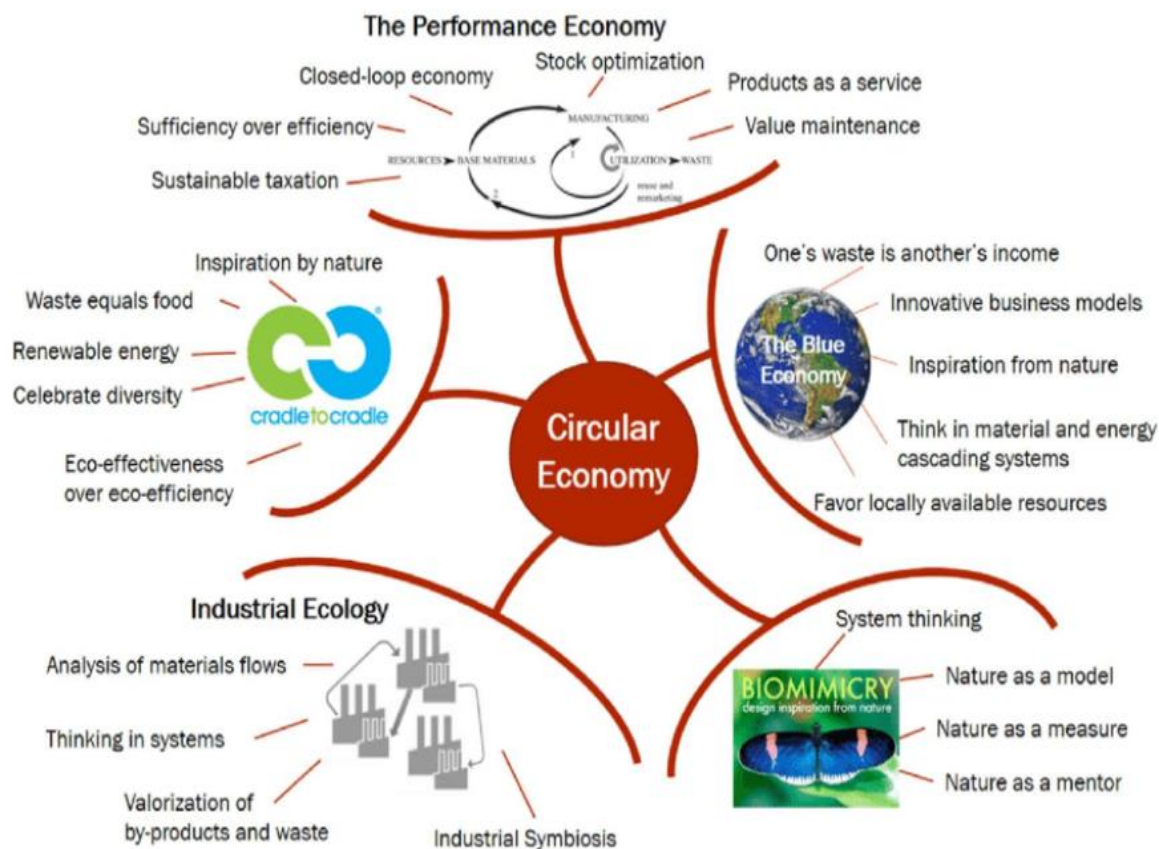


Figure 1. Circular Economy concept

Literature review

Results showed that nearly all companies are explicitly referencing CE, however, only 7% of them integrate CE within all five sustainability reporting elements. Less than one third of companies were found to include both targets and indicators for CE suggesting that overall, CE content within sustainability reports is largely superficial and inconsistent. This investigation contributes a descriptive overview of current CE reporting trends and shortcomings, as well as detailing implications relevant for academia and practitioners developing sustainability reports and/or CE assessments. The transition towards a CE requires transparency, therefore, further research and engagement is needed to better define the value of CE within external corporate communication. authors such as [Pástor and Vorsatz \(2020\)](#), argue that for investors, sustainability is now seen as a necessity, rather than a luxury good. Second,

Several regulations concerning sustainability reporting are currently being revised, including the recent European adoption of the Corporate Sustainability Reporting Directive (CSRD) ([European Commission, 2021](#)), which is an update of the previous Non-Financial Reporting Directive first published in 2014 ([European Commission, 2014](#)). These revisions aim to prevent and reduce rising instances of ‘green washing’: the corporate practice of claiming or

exaggerating sustainability with the purpose of hiding a questionable environmental or socio-economic performance (Braga Junior et al., 2019; Uyar et al., 2020). CSRD (European Commission, 2020, 2021). CE aims to redesign waste and resource management processes and can be defined as where “the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste is minimised” (European Commission, 2015, pp. 2). This novel inclusion of CE perpetuates the mainstreaming of CE practices and terminology, indicating that investors will be encouraged to identify and support companies adopting CE objectives

Indeed, this approach to content analysis may foster the narrative that CE is replacing sustainability (as discussed in D'Amato, 2021) as opposed to the dominant CE discourse held by many academics, companies and policy-makers that CE Action Plan, (European Commission, 2020), as well as for financial and non-financial reporting (e.g., the CSRD (European Commission, 2021) and the European Financial Reporting Advisory Group (EFRAG)). Additionally, if the company classified material issues according to the three main dimensions of sustainability – environmental, social or economic –, it was noted how the CE-related material issue was classified; Financial reporting should integrate social and environmental aspects into decision making. Thereby assessing the value of a company's overall performance across different indicators. Importantly, although environmental social and governance information has financial consequences, this often remains a blind spot, which poses a risk to companies and investors. Accountants: Raise awareness for the importance of integrating nonfinancial information into financial reporting. Accountants in business should experiment with integrating non-financial information in their reporting. External auditors should support field experiments and provide assurances for impact data upon request. They can increase assurance on the reliability of the impact data and prevent green washing in integrated corporate reporting. This way, accountants can ensure that not only the positive but also the negative impacts are reported in a properly integrated and balanced way. Last but not least, accountants also play an advisory role in the establishment of the reporting guidelines. In recent years, climate change mitigation and adaptation efforts and treaties such as the Paris Agreement have led to financiers and investors including the environmental and social impact of companies in decision making processes. At the same time, businesses across sectors are searching for ways to stay competitive while improving their environmental and social impact. Today, financial statements present the most relevant indicators for determining a business's financial position and continuity (going concern). These financial statements and calculated ratios (solvency, liquidity and return on equity) help management and investors in decision making processes. However, the financial statements find their origin in linear business models, in which companies and their auditors are used to depreciate material assets over time while not taking into account external costs and benefits. Ultimately, stakeholders and shareholders want to know what non-financial information is really important in relation to continuity and both financial and non-financial performance, and all frameworks have introduced the concept of materiality. There are a few dominant frameworks out there. In 1992, the Harvard Business Review published its conceptual framework, which later became popular with the early adopters of corporate social responsibility. In 1997, the Global Reporting Initiative (GRI) launched its framework and related KPIs on social, environmental, and economic performance. Sustainable Accounting Standards Board (SASB) developed a stricter framework for companies to report on ESG. In 2013, the International Integrated Reporting Council (IIRC)

launched its value creation framework, in which the triple bottom line of social, environmental and economic value, was expanded into six capitals: financial, manufactured, intellectual, human, social and natural: the basis for our methodology Together with new legislation worldwide and specifically with the EU leading with the Sustainable Financial Disclosure Regulation (SFDR) for financial institutions and the Corporate Sustainability Reporting Directive (CSRD) (previously called the Non-Financial Reporting Directive (NFDR), it has helped the external reporting to develop. Because of SASB guidelines and the Corporate Sustainability Reporting Directive (CSRD) EU directive, which has to be implemented by EU member states by 2022, a growing number of businesses disclose in the management report of their (integrated or combined) annual report on nonfinancial strategy, policy and performance of their sustainable practices. “The accountancy profession has a great opportunity to play a key role in transforming high-quality disclosure requirements being developed by the International Sustainability Standards Board (ISSB) into consistent, comparable, and assumable information for investors and the capital markets.” Lee White Executive Director, IFRS Foundation.

Tools and methodology

3.1 Research methodology

Studies addressing CE and embracement from policies and companies do not exist for the case in Albania. A vast amount of research has been done on the OECD countries giving evidence of successful outcomes and limitations on CE reporting. The objective of this study is to collect, analyze and provide an approach to circular accounting and to develop guidance on how to report in a sustainable way. This study is based on a review of the academic papers and policies implemented in EU countries.

The current accounting system does not reveal any real social and environmental costs, such as emissions, pollution and negative social impacts of economic activity. In this regard, many accountants and investors are concerned about the inability of the traditional financial reporting system to provide the information needed to assess the performance of the organizations (Ong et al., 2010). It does not only consider financial information and neglects non-financial information that is material to measure the value of the company and non-financial risks (Serafeim, 2016). In addition, the traditional financial reporting system has been developed primarily for the industrial environment concerned with maximizing profits as a top value for the company. Although the current financial reporting system plays a key role in managing financial capital, it focuses on a narrow performance perspective that is historical performance expressed in monetary units only (Beck et al., 2017)

to raise awareness on the linkages between the circular economy and sustainable finance – two mutually enabling policies supporting the required global transformation, as envisioned in the 2030 Agenda for Sustainable Development and the Paris Agreement.

3.2 CE reporting and European policies

The global use of both renewable and non-renewable resources continues to grow and is expected to double in the next 40 years¹⁴³. The resulting negative externalities such as climate change, biodiversity loss, waste, and pollution, as ‘the extraction and processing of materials, fuels, and food contribute half of total global greenhouse gas emissions and over 90 percent of biodiversity loss and water stress’ according to the UN Environment’s Global Resources Outlook 2019. Hence the conclusion that the pressure on resources is deemed to be no longer sustainable.

In order to safeguard the future stocks and flows of resources along with their benefits to society, as well as to address the risks of negative externalities, there is a need to secure both:

- (a) the reduction of the extraction of non-renewable resources with a priority based on the existing residual stock and the decoupling of economic activity and extractive practices (e.g., through circular business models increasing asset utilization or lifespan); and
- (b) the implementation of practices that secure the regeneration of renewable resources (e.g., soil regeneration rather than depletion) and keep resources in the economy at their highest value (e.g., cascading food to feed to material feedstock).

To ensure consistency with the political targets of the European Union, and to fit to other frameworks, the [Draft] ESRS E5 has been aligned with:

- (a) the EU Circular Economy Action Plan published in March 2020;
- (b) the Platform on Sustainable Finance’s report that was published on 30 March 2022 with recommendations on technical screening criteria for the four remaining environmental objectives of the EU Taxonomy;
- (c) the principal adverse impacts (PAI) indicators requested by Annex I of the European Commission Delegated Act supplementing Regulation (EU) 2019/2088; and
- (d) the EU Industrial Strategy published in March 2020 and related update proposal published in May 2021; “The new Circular economy action plan presents a set of interrelated initiatives to establish a strong and coherent product policy framework that will make sustainable products, services and business models the norm and transform consumption patterns so that no waste is produced in the first place. Empowering consumers and providing them with cost-saving opportunities is a key building block of the sustainable product policy framework. As stated in the Commission’s 2020 new Circular Economy Action Plan, the EU needs to accelerate the transition towards a regenerative growth model, advance towards keeping its resource consumption within planetary boundaries, and therefore strive to reduce its consumption footprint and double its circular material use rate in the coming decade. The action plan also highlights how scaling up the circular economy will make a decisive contribution to achieving climate neutrality by 2050 and decoupling economic growth from resource use, while ensuring the long-term competitiveness of the EU and leaving no one behind. More broadly, transitioning to a circular economy not only addresses the negative impacts of the

¹⁴³ UN Environment’s Global Resources Outlook 2019

linear economy, but more importantly, it represents a systemic shift that builds long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits.

The Taxonomy Regulation highlights the importance of increasing durability, reparability, upgradability, reusability and recyclability, in particular in designing and manufacturing activities, prolonging the use of products, including through reuse and remanufacturing, and recycling (Regulation (EU) 2020/852 (Taxonomy) on the establishment of a framework to facilitate sustainable investment). The “transition to a circular economy” is the 4th of the 6 objectives under the EU Taxonomy.

The EU's new Industrial strategy states that consumers should receive trustworthy and relevant information to choose reusable, durable and repairable products. It states that consumers should receive trustworthy and relevant information to choose reusable, durable and repairable products. The Commission will propose ways to improve consumer rights and protection, including by working towards a ‘right to repair’ for consumers.

The European Green Deal aims to transform the EU into a modern, resource-efficient and competitive economy with no net emissions of greenhouse gases by 2050⁴⁴. It will decouple economic growth from resource use, and ensure that all EU regions and citizens participate in a socially just transition to a sustainable economic system. It also aims to protect, conserve and enhance the EU's natural capital, and to protect the health and well-being of citizens from environment-related risks and impacts.

In its December 2020 resolution on sustainable corporate governance, it welcomed the Commission’s commitment to reviewing the NFRD, called for an extension of the scope of the NFRD to additional categories of companies, and welcomed the Commission’s commitment to developing EU non-financial reporting standards¹¹. The European Parliament also considered that non-financial information published by companies pursuant to the NFRD should be subject to a mandatory audit.

The impact assessment focused on policy choices in three areas: (1) standardization – whether to develop EU sustainability reporting standards and require companies to use them; (2) assurance (audit) – whether reported sustainability information should be assured and if so, at what level; and (3) scope – which categories of companies should be subject to the reporting requirements.

To realize these benefits, the sustainability information disclosed in undertaking’s annual reports first has to reach two primary groups (‘users’). The first group of users consists of investors, including asset managers, who want to better understand the risks and opportunities that sustainability issues pose to their investments and the impacts of those investments on people and the environment. The second group of users consists of organizations, including non-governmental organizations and social partners that wish to better hold undertakings to

44 On 4 March 2020, the Commission adopted the Proposal for a Regulation of the European Parliament and of the Council establishing the framework for achieving climate neutrality and amending Regulation (EU) 2018/1999 (European Climate Law) (2020/0036 (COD)), proposing to make the objective of climate neutrality by 2050 legally binding on the EU.

account for their impacts on people and the environment. Other stakeholders may also make use of sustainability information disclosed in annual reports. The business partners of undertakings, including customers, may rely on this information to understand, and where necessary report on, the sustainability risks and impacts through their own value chains. Policy makers and environmental agencies may use such information, in particular on an aggregate basis, to monitor environmental and social trends, to contribute to environmental accounts, and to inform public policy.

Sustainability reporting standards should be proportionate, and should not impose unnecessary administrative burden on companies that are required to use them. In order to minimize disruption for undertakings that already report sustainability information, sustainability reporting standards should take account of existing standards and frameworks for sustainability reporting and accounting where appropriate.

The “Circular Economy Missions to Third Countries” of the European Union Commission, focus mostly on the topics of eco-innovation, marine pollution and urban environmental best practices. The main objective is to increase the cooperation between the EU and third countries in the field of environmental policy. Therefore, the following objectives need to be reached:

to sign political agreements directed at fostering the circular economy, green public procurement and innovative, sustainable and inclusive growth,

to achieve a better understanding of the environmental challenges faced by third countries

to promote green solutions through business partnerships abroad (In this regard, the missions will organize matchmaking events between European and local entrepreneurs and will engage in exchange of views with targeted audiences).

The policies discussed during the missions gravitate around circular economy, resource efficiency and sustainable use of natural resources. These issues offer a wide area for further bilateral discussions, not least because they have a great potential for innovative business solutions

The financial reporting system is one of the traditional methods used by companies to demonstrate the value and performance of the company through annual financial reports. Nevertheless, financial reports typically concentrate on presenting financial information related to sustainable energy management, and the financial report does not contain any non-financial details related to the social and environmental effects of the company's economic activities. The explanation for this is due to the complexity of the accounting and dual-entry information system. The accounting system records only transactions and units that can be expressed in a financial form, either as non-financial information, descriptive or in a quantity measured in non-monetary units that cannot be recorded in the accounting books.

The adoption of the Integrated Reporting framework therefore involves a fundamental reform in the conventional accounting system to accommodate both financial and non-financial information. Integrated Report (IR) has been first issued on January 25, 2011, as a guideline documents for the companies listed in Johannesburg Stock Exchange [12]). An integrated report presents a single documents that cross the financial and non financial-environmental, social and governance-performance. In order that uniform standards and rules to be issued, the

International Reporting Council was formed in 2010, the organization that provides the framework in how to compile the IR. According to the IIRF, the objective of an integrated report is to explain “how an organization’s strategy, governance, performance and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long term” integrated reporting aims at reporting not only the company’s strategy, management and financial performance, but also social, environmental and economic impacts.

In the IR, all information about the company is included in one report as a whole. Therefore, information users can easily access all the information of the company directly in a single report format. The integrated report also increases the overall performance of the company. The integrated report also includes estimates and information about the future situation of the company, not just the current situation. All data on the sustainability of enterprises are presented. In the integrated report the economic and financial information, but also sustainability risks and analyzes are presented. The report describes the risks and opportunities that the company may face in the future and provides information about the strategies that the company will implement. One of the most important issues in the integrated report is the determination of the added value of the company to the community and the environment. The fact that this added value is expressed in numbers may be much more descriptive.

A shift to a circular economy is not an option but an inevitable response to a growing world population, increasing prosperity, and limited availability of natural resources. Transitioning to a circular economy involves great business chances and can create new employment opportunities. However, considerable barriers exist to a widespread adoption of more circular practices, including economic incentives, accounting rules, and regulation that often favor conventional linear solutions and business models.

Accounting methods also tend to put circular businesses at a disadvantage due to the rules for depreciation of physical capital. Companies are fiscally incentivized to depreciate as quickly as possible. This conflicts with the idea of a circular economy in which value preservation is the key.

Value added taxes (VAT) do not currently differentiate between new products and materials, and circular ones. VAT also create high upfront costs for companies that purchase products to be leased to customers.

There are many new opportunities but also many hurdles related to circular economy finance.

- The finance industry has a very important role to play in promoting sustainability and is already showing significant leadership. Prices and accounting rules that create adverse incentives need to be addressed. Improved tools and procedures that help investors and lenders evaluate risks associated with linear and circular business practices are required.
- A more holistic approach to sustainable finance beyond climate is needed. There are strong link-ages between climate change mitigation and circular economy and biodiversity protection. This can help stimulate investments in circularity.

- The shift to a circular economy needs to be widely supported. Innovation, lifestyle changes and demand by both companies and consumers are required. International collaboration and experience sharing can be helpful

Accounting and financing have the potential to drive the circular transition. Current accounting and reporting techniques that have been designed for the linear economy are often ill-equipped to truly capture the value and positive impact of circular businesses. Circular accounting describes the practice of measuring, analyzing and reporting on a company's financial and non-financial performance, to truly reflect the value and impact of circular businesses on all relevant stakeholders. The transition to a circular economy will require rethinking our present way of doing business—and we must not overlook the pivotal role of accounting.

CE reporting and relevant organization

Reporting requires the compliance of traditional statements as well as quantitative and qualitative information.

At present, financial statements constitute the most important indicators of businesses' financial position and continuity. These financial statements and calculated ratios (solvency, liquidity and return on equity) inform the decision making processes by the management and investors. However, financial statements find their origin in linear business models, whereby companies and their auditors tend to depreciate material assets over time, not accounting for external costs and benefits, and not able to appreciate the value of residual resources and harvested products and materials. As a result, the (financial) value of circular impact remains hidden.

The question is how accounting can be improved to be fit with the circular economy? Further the responsible current organization is described and what is their contribution to CE.

An accounting method that accounts for the true cost can help underpin the business case. "True cost or price" is the difference between the market price and the weighing of cost and benefits to society. These methods generally account for hidden costs that are not reflected by the unconstrained market price. In addition, the IFRS Foundation, which developed globally accepted accounting standards, may play an important role in global ESG standard-setting, if it contributes to developing global sustainability standards.

Sustainable Accounting Standards Board (SASB)

SASB has also included performance indicators related to the circular economy, primarily from the waste and recycling angle.¹⁸³ Company performance under the SASB standard can be analyzed by the following performance metrics:

- Amount of waste incinerated, percentage hazardous, the percentage used for energy recovery;
- Percentage of customers receiving recycling and composting services, by customer type;
- Amount of material recycled and composted;

- Amount of electronic waste collected, percentage recovered through recycling.

The barrier is the collection of data. The optimal way to get the data is to regulate it or pay for it. Even then, many businesses will be reluctant to share these data for competitive reasons. A first and crucial step is to arrange operational capacity to weigh materials being handled, as this will often not be present.

CE and accountancy

The accounting profession is changing, particularly for CFO's departments at financial institutions as awareness grows about climate change and circular economy. Five trends that favour the transition towards more sustainable consumption and production and circularity in the financial sector should be catalyzed and professionalized by accountants themselves:

1. The use of financial calculation models to determine the appropriate residual value and depreciation rates for secondary materials and reusable/reused assets (e.g. building materials in existing buildings);¹⁸⁴
2. Tracking and solving contradictions in tax treatment of virgin versus secondary materials, for example double VAT taxation of secondary materials in certain jurisdictions;¹⁸⁵
3. Integration of non-financial ESG related metrics by using full cost¹⁸⁶ / true value¹⁸⁷ / true cost / true price¹⁸⁸ accounting methods;¹⁸⁹
4. Actively working with the audit discipline to improve the assurance and reliability of non-financial numbers;¹⁹⁰
5. Contribution to transparency by including linear risks in their financial reporting, especially in light of stranded assets;¹⁹¹
6. The increase of the number of members of accounting or CFO led platforms that aim to make sustainable decision-making part of the mainstream

Firstly, the survival and development of any enterprise cannot be separated from the social environment and the natural environment.

Secondly, the disclosure of circular economy information, especially the disclosure of resources and environmental information, will enable responsible companies to obtain good image and market returns in the public, capital markets, and product sales markets, while also stimulate the enterprises with bad environmental behavior to improve environmental pollution control and improve environmental behavior

In traditional accounting, the monetary measure is used, but in circular economy accounting, both monetary measure and nonmonetary measure should be used. Because resource asset comes from the long-time accumulation of nature, there is no human labor in it, it is impossible to make sure its value according to the method of social labor productivity, hence, its value should be determined by the method of indirect calculation

Sustainable development is the presupposition of theory and practice of accounting in circular economy. Accounting in circular economy should check and supervise the economic activity of enterprise, reflect the energy exchange and value transfer between enterprise operation and environment on the basis of sustainable development of human society. The current teaching contents of accounting only involve a linear process from resource environment to product realization and economic benefit. It is not aware that economic operation is closely related to the natural environment, neglecting the impact of resources and environment to enterprises and the impact of enterprises on the natural environment, ignoring the material replenishment process of the environment itself and the environmental responsibility of the company. Specifically, the current contents of accounting professional education does not bring up natural and renewable resources as assets, does not confirm social responsibility, safety production responsibility and environmental protection responsibility as corporate liabilities

The circular economy is completely different from the traditional economy. It changes the open material cycle, that is, the traditional economic development model of “resources-products-waste”, to close the material cycle, that is, the innovative development model of “resources-products-renewable resources”. To achieve "low exploitation, full utilization, low emissions", maximize the use of system materials and energy, improve resource utilization, minimize pollutant emissions, improve economic operation quality and efficiency, and protect the ecological environment. The era of circular economy puts forward higher requirements for accounting professional education. Accounting information should be true, accurate, timely, convenient, applicable and practical, not only to reflect the actual situation, but also to predict the future.

The traditional accounting methods cannot accommodate the development of circular economy, so it is necessary to reform in the accounting methods

Conclusions and recommendations

The International Financial Reporting Standards Foundation (IFRS) is leveraging some of the existing guidelines to bring sustainability into financial disclosure. These efforts represent a promising starting point for creating universally accepted sustainability accounting standards. Circular accounting can become not just as an enabler, but a driver of the circular transition. Circular accounting and reporting are the key for making the circular economy a reality. Cross-sector collaboration and a global mindset change are the key to enable a timely and systemic shift to a circular economy. We call on businesses, accountants, regulators and financiers to act now and take responsibility and play a part in the circular transition. Only when it is clear which indicators to measure, which framework to adopt, and which methodology to use, can non-financial figures be integrated into strategic decision making. Additionally, when sector wide norms are established in terms of a reference scenario and impact indicators, it can be argued whether a business still maintains its license to operate. When benchmarking becomes possible, sector wide norms can inform us about how companies perform on negative and positive impacts relative to one another and relative to the sector benchmark.

Circular accounting describes the practice of measuring and analyzing a company's financial and non-financial performance, to truly reflect and account for the value and impact of circular

businesses. It moves beyond the limited, finance-based accounting of a company and represents its broader impacts on the environment, society and the economy

Circular accounting is about making the 'intangible' impacts of the circular economy tangible and measurable in order to disclose them

Closely related is the notion of circular reporting, whereby organizations report on their environmental and social performance, on top of their financial results. It requires companies to not only collect data but to disclose them—revealing their impact, both positive and negative, on the human and natural environments. Circular accounting and reporting are complementary processes that will play a large role in the circular transition when used in tandem.

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The challenges of implementation of Circular Economy accounting policies: The case study of Albania

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Abstract

The socio-economic dynamism occurring in recent years brings about the need for several actions to ensure well-being and accelerates the shift to the circular model economy. This strategy is considered to reduce climate risk and fosters more opportunities, efficiency, and resilience. The study analysis the need for harmonization between accounting financial reporting practices and sustainability reporting requirements. The issue gets a greater awareness when it is scrutinized for less developed countries. A deep investigation is performed for the country of Albania, where there are realized the challenges of implementing European Union directives and ISSB circular policies. Analytical analysis derived from previous literature indicates there is insufficient data and measurements to reap the benefits of such harmonization, integration, and standardization of reporting. The research proposes that the Albanian government should progress in operation by eliminating waste and pollution, circulating products and materials, and regeneration of nature. These three approaches will contribute to materializing the intangible value of the eco-design businesses and financial and non-financial reporting to the stakeholders. The study concludes that Albania is performing in its early stages of a circular economy and further actions should take place to embrace this industrial revolution, to achieve long-term growth, development, and sustainability.

Keywords: Circular Economy, circular accounting practices, European Commission, circular risk, value.

Jel Code: M - Business Administration and Business Economics; Marketing; Accounting, O - Economic Development, Technological Change, and Growth, Q - Agricultural and Natural Resource Economics; Environmental and Ecological Economics.

1. Introduction

The socio-economic dynamism occurring in recent years has brought about the need for several actions to ensure improvement and well-being. The day-to-day human activity has impacted on the damage of the environment and depleting the resources. The circular economy is considered a new and alternative mechanism to prevent deterioration and ensure better socio-economic performance. This type of economy aims to minimize waste and pollution at a higher rate, prolong the life span of products and revitalize nature, and at the same time foster economic growth, employment, wealth, and sustainability. As an economic model based on the maximization of efficiency, it is being embraced by several countries, organizations, and many institutions that are engaged to achieve the implementation of its practices. (1)

The transition from a linear to a circular economy requires the adaption of various policies and the cooperation of many stakeholders. However, the risk remains in both linear and circular economies. In the first approach, there is a produce-use-waste way of production and consumption. The whole process is assessed to have unfavorable consequences such as scarcity of resources, lack of biodiversity, and an increase in global warming. These environmental disorders are affecting economic factors such as supply, input cost, and price stability. The firms and nations should compete to possess the natural assets to lead the market and maintain their position. The linear operation bears a significantly high risk since the market is headed towards an environmental strategy and the old method does not fit the new business model. In such circumstances, it is essential for companies and other NGOs to explore and adopt an eco-design implementation of their performance. (2) Even in this upgrade, the risk is present and makes the process complicated. Various valuations should take place in the assets and results, to assess the efficiency of this revolution. Different international standards setter such as the International Sustainability Standards Board (ISSB), European Commission and Taxonomy, Institute of Internal Auditors (IIA), Task Force on Climate-related Financial Disclosures, and other bodies are working to provide for global standards of the circular economy and promote best practices all over the world.

The structure of the paper is divided into five chapters. The first part shortly introduces the background of the circular economy. It presents the necessity for society to shift from a linear to a circular operation and to achieve economic and environmental sustainability. The following chapter provides a full literature of recent findings on circular economy and accounting reporting. It highlights the importance of finance and accounting in giving material value to all the outcomes provided by this circular approach. Furthermore, it depicts several policies and actions undertaken by institutional or governmental stakeholders to mitigate the risks and develop opportunities for this ecological transformation. The third section shows the methodology of the study. The fourth chapter analysis the implementation of these financial and accounting practices in a transition country, the case study of Albania. Moreover, it elaborates on the relevance and the difficulties of the circular model in transition and developing countries. The last section concludes that the circular economy model will contribute to resilience and on the need for further actions should be taken in Albania to embrace the standardization of the reporting, to achieve long-term growth and development.

2. Literature

2.1 The transition to a circular economy

Nowadays the society is confronting outstanding challenging counting population growth, supply insufficiency, economic disorders, and price destabilization. The countries are undergoing rapid industrialization while experiencing climate crises, depletion of resources, and global warming. In these circumstances, political authorities and business stakeholders have perceived that there is an urgent need for a fundamental transition to a more environmental approach. The dynamism accelerates the shift to the circular model economy, which is considered a strategy to reduce climate risk and provide more opportunities, efficiencies, innovation, and resilience. (3)

The third industrial model applied the linear economic practices, where a flow of “take-make-waste” approach did not effectively use the resources and the outputs have no remaining value after the consumption. Before embracing a circular model, there is a necessity to understand the risk that the previous approach maintains, to realize the opportunities of the new revolution. Linear risk is considered the exposure that firms would face under the operation of the linear mechanism. The firms have as their main objective the maximization of profit, which consists of an increase in sales, and short-term results, associated with the inability to proceed as a going concern. This risk is related to the scarcity of raw materials, deficiency in collaboration, and failure to achieve innovation and adaption. (4)

Conventionally, the environmental risk has been excluded and no assessment has occurred regarding the negative outcomes that firms might have in the social and ecological impact. There were no penalties for the negative externalities that firms contribute to the deterioration of the ecosystems. Contrariwise, no advantages or material rewards were provided to the businesses that function under an eco-design principle. The assessment of the externalities should be supervised and controlled by the legislation. European Commission and the Task Force on Climate-related Financial Disclosures have given a significant contribution to environmental policies. Other stakeholders may contribute to the awareness of these externalities. The dynamics of the recent developments anticipate price volatility and product shortage. These two factors will enforce competent authorities to take appropriate measures to mitigate the risk and stimulate ecological efforts.

Knowing of risks in linear practices helps to analyze the opportunities existing in the circular business models. The new approach is a new proposal that will help mitigate the negative outcomes of the traditional economy and to provide a new framework of economic models. The firms following this transition can analyze the benefits and reuse the raw materials and products to their complete capacity, produce eco-designed commodities and affect customers' behavior. (5) These initiatives undertaken by firms and NGOs prior to other businesses in the market also might bear the risk of uncertainty of the performance in a circular approach. There is a huge disparity between the conception of circular economy and the application of its practices since there exists a lack of information and measurement of firms that have successful results from this revolution. (6) Even though many researchers admit that circular strategies decrease the necessity of non-renewable resources and the forthcoming market volatilities. The circularity brings about the application of smart assets and intelligent technologies, which developed a more valuable circular model. (7) The circular approach and the risk of default present a significant and negative interrelation in the long run. (8) The econometric model performed in European countries shows an intense correlation of circularity with growth, innovation, and wealth. (9)

2.2 Finance and accounting, the drivers of circular economy

The circular economy will affect the macroeconomic and financial projections. The shift would require several assessments of decision-making, default probabilities, and business risks. (10) The financiers and accountants should adapt the instruments and standards to provide an accurate measurement of the financial and non-financial data. Circular accounting is a new deviation from traditional practices, which reflects the quantification of the effects of the circular economy. The ability to compute the value of resources and long-term risk affected by socio-environmental consequences increases the awareness of stakeholders and provides them with detailed information about the business going concern. The developments in accounting are considering contingent assets, residuals' pricing, depreciation, and provisions. Alternative ways to increase the accuracy of the value of the assets and liabilities are the growth of secondary markets, which may contribute to the validation of what is considered waste in a linear economy. Integrated financial and non-financial information might also assist in the proper reflection of the performance of the companies operating under a circular approach. (11) New auditing methodologies demand advanced tools and technology to present the current transition of economy and accounting. (12)

Standardization of the reporting is a necessity to guarantee the reliability and comparability of the financial and non-financial reports. This inclusive transformation of reporting requires the collaboration of different institutions, policymakers, stakeholders, and firms. International Sustainability Standards Board (ISSB), as an independent authority regarding IFRS sustainability standards, is considering the approval of a new standard regarding the reporting of sustainability. (13) Task Force on Climate-Related Financial Disclosures provide recommendations on voluntary disclosures for climate-related risk. These disclosures are crucial for firms operating under the circular economy. Climate change and the deprivation of natural resources affect the markets, trends, production, and demand. All this exposure to intangible factors should be analyzed and reported in the disclosures of environmental impact. (14) European Union is working on regulations and has provided several actions and enforcements to member states to better embrace circularity and maintain sustainability. European Commission is working on the proper legislation and taxonomy to provide a framework for sustainability reporting. (15) The committee of European Sustainability Reporting Standards has required the EFRAG (European Financial Reporting Advisory Group) to provide assistance in developing sustainability reporting standards to be used in circular economy reporting. (16) The European Security and Markets Authority has issued its annual statement, where it prioritizes environmental matters. The imposition of reporting climate-related affairs highlights the valuation of contingent assets, provisions, and agreements. There should be consistency between the financial statements and non-financial information. (17)

Several NGOs are working on preparing various methodologies and measurements to appropriately represent the socio-environment influence in financial reporting. The Impact-Weighted Account Projects demonstrate the future risk and possibilities of circular economy through various research. (18) Ellen MacArthur Foundation, as the initiator of circularity, is stimulating companies to embrace the new industrial reform by manifesting several analyses and evaluations of eco-design businesses. (19) Even though there are many advisory agencies promoting a circular economy, still there are many studies that testify that few businesses do consider the impact of climate-related risk in their reporting information. Carbon Tracker, a

research organization, has reported on the degree that companies have reported environmental influence. In the 2022 report, it is presented that very few entities do consider the circular risk and advantages in their financial statements. Companies operating in developed countries find difficulties in applying circular accounting. (20) The issue gets higher awareness when scrutinizing practices in less developed countries.

3. Data and Methodology

The research is based on the analytical analysis derived from previous literature and reports. The source of the information is provided by relevant research papers which provide significant outcomes on the performance of the economies under a circular approach. Moreover, the study represents findings and implications from several authorities and institutions such as ISSB, European Commission, and Accountancy Europe. Investigations from popular NGOs working on climate-related risk, are interpreted to provide a full framework for the application of the disclosures and accounting practices in the circular economy. The study of the implementation of the European Union directives and sustainability standards issued by ISSB and EFRAG in Albania is performed through data derived from local and international institutions. There is a restriction on statistics for the performance of companies operating under circularity in Albania and previous research do not provide sufficient evidence on this issue.

4. Circular Economy in Albania

The harmonization of accounting practices and sustainability reporting becomes more laborious when it is applied to less developed countries. The study analyzes the adaptation of the circular approach in the Albanian economy and the difficulties that the firms would face while reporting for sustainability matters. Albania, like other Western Balkan countries, is less environmentally friendly compared to the other countries of Europe since it is not able to manage efficiently its waste. These non-ecological applications consist of the depletion of nonrenewable resources and the incapability to fully use the products by reusing and recycling them. Albania and North Macedonia are more willing to integrate into the new European directives compared to the neighboring countries. (21) The evaluation of the adoption of the EU policies is based on four principles: manufacturing and utilization, waste management, the full-use of resources, and technology and innovation. The economy is performing below its expectancy. Firstly, the imports in 2021 are 13.3% lower than the exports, so the society is not using its resources at its fullest capacity, but it is relying on imported goods. (22) Secondly, Albania manages waste at a low percentage focusing only on urban waste in three incinerators in building process located in Tirana, Elbasan, and Fier. Even though there is a mismanagement of the resources, the consumers' behavior is influenced by the new approach. Albanian consumers are being sensitized and are more sensitive to ecological products. (23) However, the number of private recycling companies recycling plastic, glass, paper, and scrap is small and Albania's economy is in its early stages of innovation. (24)

Circular accounting will contribute to materializing the intangible value of the eco-design businesses and financial and non-financial reporting to the stakeholders. General financial and non-financial reporting in Albania is regulated by Law No.25/2018 on "Accounting and

Financial Reporting” (25). New amendments have been made on accounting and auditing to better comply with the relevant EU directives, but the issue of sustainability reporting and assurance on sustainability reports is still in the very early stages. Since 2019, PIEs (public interest entities) are required to provide annual reports disclosing other than financial information. Following the CRSD, Albania as an EU candidate country that has opened the negotiations for joining the EU, from 2024 may be obliged to request the PIEs to report on sustainability and disclose climate-related risks. In addition, there are subsidiaries of foreign companies, which should report using the same standards as for the consolidated financial statements. (26) There is a need that local markets and policymakers to facilitate the process of materializing the remaining value of products and waste. It would provide a fair value of the outcomes of the circularity, will have an impact on the cost of recycling, and determine the benefits of reuse. Although there are many difficulties and borders to embracing the circular economy in Albania, there are a few firms that have demonstrated a high inclusion in this circular approach and have a material impact on the environment and society. (27)

5. Conclusions and Recommendations

The paper highlights the significance of the Circular Economy as a foundation for ensuring development and sustainability in all countries, both in developed and less developing ones. The study reveals the opportunities provided by the eco-design model and provides an analysis of the financial uncertainties. It is stated that these ecological tools efficiently influence both the markets and the environment. A considerable number of global organizations and institutions support the advancement of the circular approach; however, it is realized that there is still a huge gap between the theoretical policies and the implementation of their practices. The issue arises when moving from a macro perspective toward the individuals’ and firms’ operations. Many institutions such as ISSB, Task Force on Climate-related risk, European Commission, EFRAG, etc., are contributing to concretizing the circularity tools and assessments and providing adequate legislation to better facilitate this complicated transition. Ellen McArthur Foundation develops the idea by determining the performing goods and services that environmentally impact over their life span and calculating their usefulness. It is challenging to define the value and materialize the efficiency gained from recycling and reusing products and protecting the environment.

This topic holds greater importance when discussing the application of the Circulating Economy in transition and developing countries. A deep investigation is performed for Albania, where is realized the establishment of a circular economy is in its early stages and more work and efforts are required to make visible the results of this socio-economic and environmental model. There are a few actions that the Albania government has undertaken regarding landfills and incinerators to improve waste management. It is recommended to have more subventions for firms that apply a circular approach and more externalities to those which continue operating in a linear model and increasing local pollution. Moreover, policymakers should foster the production of goods and services by using renewable resources. Even though Albania has favorable weather and several natural resources, imports make up a large percentage of consumption. The researchers advocate that the development of second markets will strongly contribute to the application of the circular policies provided by the European

Union and ISSB. Albania can launch into the fiscal and accounting policies recommended by the above institutions, but the concretization and materialization of the value that the firms earn depend on the local market. There are the local individuals, firms, and government that will determine the administration of a circular economy. It is obvious that there is a need for the recognition of data, prices, production, preferences, trends, and industries that would develop in this global industrial transition.

The circular economy is crucial because it will provide great contribution to the development and economic growth. There is a necessity for further research on this topic to provide more information about the performance, opportunities, and risks of the businesses that continue to operate or will start operating under the umbrella of the circular economy. Internationally, it is occurring a new industrial revolution, where there is a lack of tangible value in its outcomes. Nevertheless, there is a data restriction for Albania, to properly evaluate the profitability of firms operating in this new approach. Micro perspective studies are recommended to occur in the assessment of internalization standards of habitat protection, waste management, and second markets. These prospective inquiries would highly contribute to the awareness of the circular economy and the reforms to better achieve environmental protection, economic growth, and sustainability.

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Weather forecasting based on the application of SARIMA models

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Abstract

Nowadays, as the effects of the climate crisis are increasingly felt, the need for accurate weather and climate services is essential. Such a service can be useful in the future planning of activities such as in agriculture, tourism, energy and environmental control, as it can help in making decisions for planning concrete approaches. The purpose of this paper is to forecasts on climate variables using stochastic methods such as SARIMA model, by implementing this algorithm in R. We have collected data for an area of interest using monthly data from the meteorological station in Albania. Weather data attributes from January 2010 to December 2021 including monthly average minimum & maximum temperature data of Albania have been used as the set of input data. The study of scientific papers that highlight the importance of SARIMA models forecast, will be part of the literature review. The forecasting performances of the selected SARIMA model has produced better results due to RMSE (Root Mean Squared Error) and MAE (Mean Absolute Error).

Keywords: Weather forecast; Climate variables; decision- making; SARIMA; Time series analysis;

Introduction

Identifying and predicting climatic characteristics can have a huge impact on many facets of everyday human life and is known to affect the mood and the choice of everyday activities. In today's environment, climate plays a vital role in the sustainability of life on earth and all the recourses. The climate is continuously changing causing a severe issue for the planet overall. Temperature data is essential for the sustainability of agriculture, vegetation, water resources and tourism [4]. Also, the temperature has a direct impact on evaporation and melting of snow or ice and an indirect impact on precipitation condition and atmospheric stability of earth. This comes from the fact that air temperature is an important meteorological variable indicative of how hot or cold the air is and it not only affects the growth and reproduction of plants and animals, but also has an influence on nearly all other meteorological variables, such as the rate of evaporation, the relative humidity, wind speed, wind direction and precipitation patterns [6]. Therefore accurate prediction of future temperature is essential for preventing the country from happening natural disasters and managing all natural resources ([15]; [14]; [10]).

In areas where only one kind of meteorological variable is available, a univariate BOX and JENKINS methodology [2] is commonly used for analysis and forecasting of time series.

Autoregressive integrated moving average (ARIMA) models have become a major tool in agrometeorological and hydrological applications to understand the characteristics of the precipitation, temperature, wind speed, river flows, and so on.

Seasonal ARIMA (SARIMA) models are crucial to model and forecast time series that show a periodic or a non-stationary behavior both within and across seasons [3].

In this study, the SARIMA algorithm is used for future climate data forecasting. Monthly minimum and maximum temperature records were used from 2010- 2021 for the forecast. The algorithm was implemented using the R language.

The aim of this study is to inspect statistical characteristics of the monthly minimum and maximum temperature time series and select the best forecasting model using stochastic methods such as SARIMA models, in service of future planning activities like agriculture, tourism, vegetation and environmental control, by helping in decision making for concrete economical approaches in Albania.

Objectives:

Studying the effect of temperature time series in industries that get sensitive by this variable.

Analyzing statistical characteristics and approaches of the monthly temperature (min & max) time series using SARIMA model.

Selecting the best forecasting models that can be used as a supplemental tool for environmental planning and decision- making in fields such as agriculture, tourism, etc.

Literature review

Climate change will have a major impact on the environment, and socio-economic and related sectors, including water resources, agriculture and food security, human health and forest diversity[12]. Air temperature is a common meteorological variable indicative of how hot or cold the air is. It not only affects the growth and reproduction of plants and animals, but also has an influence on nearly all other meteorological variables, such as the rate of evaporation, the relative humidity, wind speed, wind direction and precipitation patterns.

SARIMA models have been used for different forecasting applications such as temperature [6]. It is a challenging task to predict future climate data accurately [13]. Although many algorithms have been proposed and developed but still, accurate forecasting is robust. The weather forecasting can be done using different ways but the most used and accurate technique is to forecast the data based on pattern recognition algorithms like data mining techniques and machine learning [10]. Autoregressive integrated moving average (ARIMA) and seasonal integrated moving average (SARIMA) techniques have been broadly applied to forecast how variables change over time. These techniques typically use (seasonal) autoregressive terms and seasonal moving average terms to forecast the changes of time series. As generally reported, these forecasting techniques regard both the preceding values of a variable and the corresponding error terms as essential information in forecasting future values. Given a large time-series data set, ARIMA and SARIMA methods show high forecast accuracy. Forecasting analysis in a variety of fields such as air temperature, electricity demand, wheat prices,

inflation, unemployment, reliability, and fishery landings has demonstrated the validity of ARIMA and/or SARIMA models [7]. In other instances, the deterministic stochastic combined technique has been successfully used by [16] to predict global temperature as recorded by the National Climate Data Centre (NCDC)[8].

Tools and methodology

In this section, we will briefly describe the methods we will utilize regarding the short-term forecasting of the weather conditions at a location of interest. We will also describe the details of each methodology that were essential for its implementation.

Study area and data acquisition

Study Area

Albania has a subtropical Mediterranean climate. Its topography is dominated by its mountains, hills, and coastline and the country's geologic and climatic characteristics result in an extensive network of rivers and lakes. As such, the country's mostly mountainous landscape is endowed with abundant water resources, diverse flora and fauna, and an extensive coastline on the Adriatic and Ionian Seas. Average annual temperatures vary from 17.6°C (in Saranda to the South) to 7°C (in Vermosh in the North) Climate Change Knowledge Portal, For Development Practitioners and Policy Makers (2022). Lowland areas are characterized by a stable mean temperature of 14°C–16°C. Maximum temperatures can reach up to 11.3°C in mountain areas and 21.8°C in lowland and coastal zones Climate Change Knowledge Portal, For Development Practitioners and Policy Makers (2022).

Data acquisition

The Albanian temperature data were collected from the Department of Meteorology[9], Albania. The minimum and maximum temperature was modelled and forecasted using the Box Jenkins Model, Econometrics, and Time-series Library (R) software. The temperature variable has 132 monthly observations for each, minimum and maximum temperature data, from January 2010 to December 2021.

SARIMA modelling using BOX-JENKINS methodology

Autoregressive Moving Average model of order p and q is formed by combining terms of AR of order p and MA of order q models. Autoregressive Moving Average model of order p and q is generally written as in Equation (1):

$$y_t = \mu + \phi_1 y_{t-1} + \phi_2 y_{t-2} + \dots + \phi_p y_{t-p} + a_t - \theta_1 a_{t-1} - \theta_2 a_{t-2} - \dots - \theta_q a_{t-q} \quad (1)$$

Box and Jenkins method is applied to fit forecasting models. Identification of relevant models and inclusion of suitable seasonal variables are necessary for seasonal modeling and their applications. SARIMA (p, d, q) (P, D, Q) model with seasonal and non-seasonal components of (p, d, q) and (P, D, Q), respectively may be described as shown in Equation (2) [2].

$$\Phi_P(B^S)\varphi_p(B)(1 - B^S)^D(1 - B)^d Y_t = \Theta_Q(B^S)\theta_q(B)\varepsilon_t \quad (2)$$

Identification of model and parameter estimation

Before model identification, the trends and decomposition of time series is performed in order to visually observe trends by interpreting time series plots. Classical time series decomposition analysis was performed [1] for each of the temperature parameters under study.

Diagnosis of forecast accuracy

The best models were identified by using R software. We evaluate the significance of the models by interpreting the values of AIC, AICc, BIC. Then the diagnosis of forecast accuracy is determined by the use of: Ljung-Box test[11] and the Box–Pierce test statistic [2], plots of residual/ACF. Also, we use the inverse roots of AR or MA of characteristic equation to prove the stability of the model. We will use RMSE & MAE to validate the present model with observed data before forecasting.

Results and discussions

Descriptive statistics of time series

The minimum and maximum values for 132 temperature observations were: -8.5 °C - 19.2 °C for the minimum temperature time series and 13.9°C - 39.10°C for the maximum temperature time series. The high variable temperature characteristic is challenging for managers while planning water resources management, agricultural activities or touristic planning in the study area. Therefore, it necessitates modelling and forecasting of temperature to provide managers with accurate information on future occurrence.

Table 1: *Descriptive statistics of monthly temperature minimum and maximum time series*

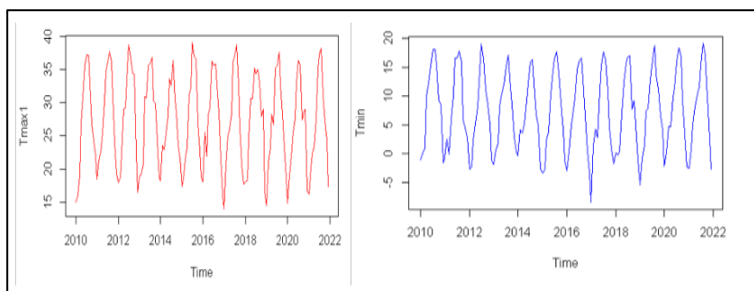
	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
>summary(Tmin)	-8.50	1.30	7.60	7.46	13.78	19.20
> summary(Tmax)	13.90	21.57	27.60	27.28	33.85	39.10

Source: own study, R software

Trends and decomposition of time series

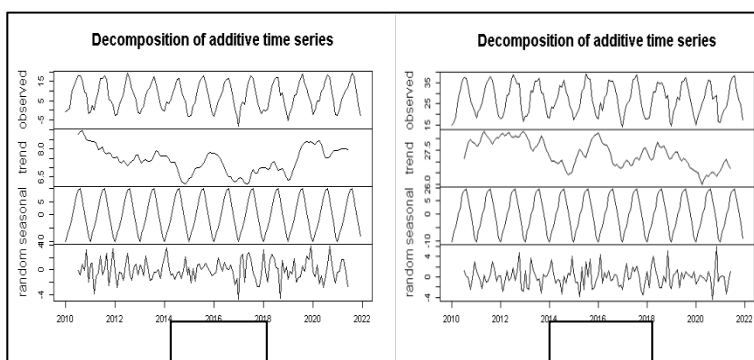
By identifying the trends that our series have we can determine whether they are stationarity or not. In figure 1, we clearly observe that there are no specific trends that should be taken into consideration. Also the seasonality of the rainfall time series can be seen from the periodic (cyclic) peaks and lows for wet and dry seasons, respectively. Based on this graphical observation in figure 2, the time series was not seasonally stationary. Hence, it is necessary to avoid the periodic component of the time series by seasonal differencing before using it for modelling and forecasting.

Figure 10: Time series plot for minimum (Tmin) and maximum (Tmax) monthly temperature data



Source: own study, R software

Figure 2: Decomposition of additive time series for Tmin and Tmax.



Source: own study, R software

Identification of the best models

After identifying that ARIMA model will need a seasonal component attached, we proceed by finding the optimal models for both time series, minimum and maximum temperature. By using R soft, we can demonstrate the best models for these time series in table 2.

Table 2: Results of model estimation

	Tmin		Tmax	
	<i>ma1</i>	<i>sma1</i>	<i>sma1</i>	<i>drift</i>
	0.2741	-0.8427	-0.8565	-
Se.	0.0818	0.1219	0.1092	0.0072
sigma^2 estimated as	4.063		4.43	
log likelihood	-286.18		-292.32	

Source: own study, R software

The optimal models identified for Tmin and Tmax are:

Tmin: ARIMA(0,0,1)(0,1,1)[12]

Tmax: ARIMA(0,0,0)(0,1,1)[12] with drift

The top best models from R software solutions were selected and presented above. Then we evaluate the significance of the models selected with the statistics AIC, AICc, BIC, known as performance evaluators, shown in table 3.

Table 3: Performance evaluations of the selected models

	AIC	AICc	BIC
ARIMA(0,0,1)(0,1,1)[12]	578.37	578.56	587.02
ARIMA(0,0,0)(0,1,1)[12] with drift	590.64	590.83	599.29

Source: own study, R software

Based on the values shown above, our models have the lowest values of all other models that were tested.

Diagnosis of forecast accuracy

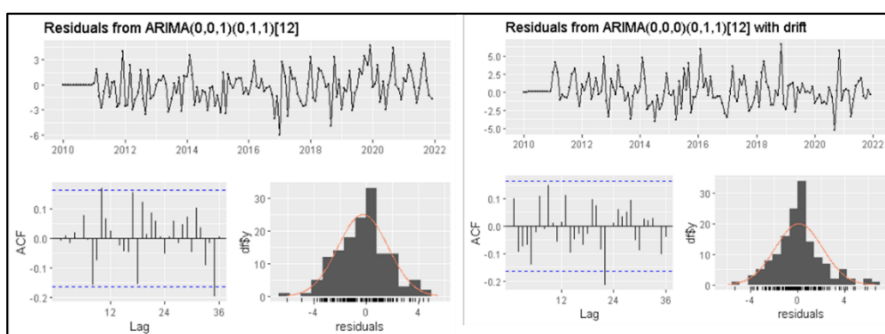
In a good SARIMA model, the forecast error or residuals should follow assumptions for the stationarity in the time series model so residuals should be white noise or independent. We use tests to prove it shown in table 4 and figure 3.

Table 4: Box-Pierce & Ljung-Box test results, SARIMA models

	> Pierce.test(res1)			>Ljung-Box test		
	X-squared	df	p-value	Q*	df	p-value
ARIMA(0,0,1)(0,1,1)[12]	0.010806	1	0.9172	24.78	22	0.3077
ARIMA(0,0,0)(0,1,1)[12] with drift	1.4383	1	0.3204	30.085	22	0.1164

Source: own study, R software

Figure 3: Residuals from SARIMA models



Source: own study, R software

The absence of autocorrelation of the residuals was statistically proven by the Box-Pierce and Ljung-Box Q [11] test for both series shown in table 4. For the Tmin time serie SARIMA

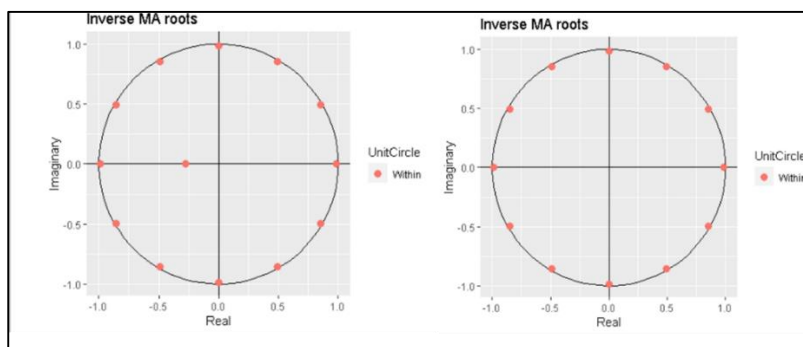
model, Ljung-Box Q' test value of 24.78 with a p-value of 0.3077 is greater than the significance level of 0, 05 ($\alpha = 0.05$), Box-Pierce.test test value of 0.01 with a p-value of 0.9172 is greater than the significance level of 0, 05 ($\alpha = 0.05$). Also for Tmax time SARIMA model, the values of the test accept the null hypothesis which assumes that our model has residuals that are white noise or independent.

Autocorrelation was checked by ACF plots in figure 3, where no significant correlation was found between the residuals because they were within the 95% confidence limits, which were close to zero for both series. This indicates that the residuals were independent or white noise. If we interpret their distribution, it is not in its perfect condition which means that we are given an indication to use other forecasting methods such as hybrid methods which are even more efficient in forecasting and would help us to make an optimal forecast thus helping industries such as agriculture, tourism, etc.

Therefore, graphical and statistical diagnosis showed no residual correlation and the highest prediction accuracy of the selected SARIMA models were proved.

We can also use the inverse roots of AR or MA of characteristic equation to demonstrate the stability of the model. In figure 4, we can see the red points which corresponds to the root of $\theta(B)$. There are inside the unit circle and we prove model stability for both time series.

Figure 4: Use of inverse roots of AR or MA of characteristic equation



Source: own study, R software

Forecasting

Before forecasting the values, it is useful to validate the present model with observed data. with RMSE and MAE performance metrics. The forecasts errors of validation set of observed data from both SARIMA models deviates from the observed data are 1.999 and 1.435 for Tmax and 1.915 and 1.451 for Tmin, respectively, which would be considered as being within acceptable range.

Table 5: Results of forecast performances of SARIMA models

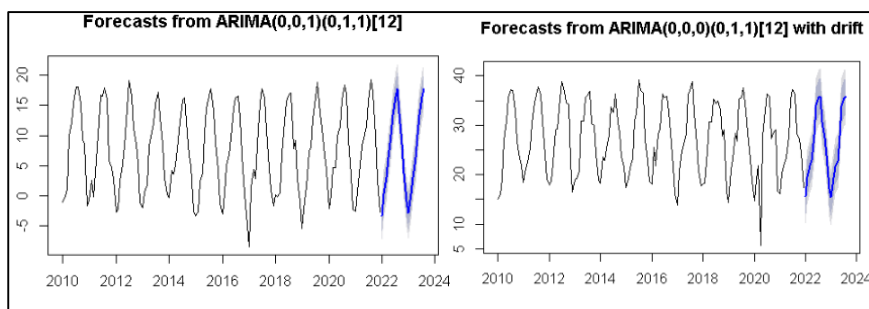
Type of data	RMSE	MAE
Validation set/ Tmax	1.999894	1.435418
Validation set/ Tmin	1.915112	1.451503

Source: own study, R software

Time series plot for observed and forecasted values

According to the above discussion, the selected SARIMA model can be used to predict future values because its prediction accuracy is acceptable. If we have a look at the time series plots in figure 5, the data are nearly close to the observed values for minimum and maximum temperature time series. Which means that we have done a good prediction. In future work, we aim use hybrid methods to have a better accuracy forecast.

Figure 5: *Time series plot for observed and forecasted values*



Source: own study, R software

Conclusions and recommendations

The temperature in the Albanian Region has changed similarly to many other area in the world, due to climate change. Many researchers have studied these phenomena in different places by using various methods and statistical tools, among them the seasonal time-series method. In general, the pattern of monthly minimum and maximum temperatures in the Albania Region from January 2010 to December 2021, was observed to have no trends but from the decomposition of time series it was shown that time series were not seasonally stationary. A seasonal autoregressive integrated moving average (SARIMA) model was selected for both series, by following the procedures of the Box–Jenkins SARIMA model building. Based in our results and the models diagnostics performed, the identified models were found to be good models for predicting future minimum and maximum monthly temperatures in Albania. Nonetheless, diagnostic tests were used to validate the developed models. We observed that our series had seasonality as a component, seasonal influences which was proved by the final SARIMA models.

It was also observed that we can use better methods such as hybrid methods to have a more accurate forecast for our weather variables.

These models will give as information that helps to establish strategies for proper planning of agriculture, tourism etc. in the respective regions of Albania by affecting our economy or can be used as a supplemental tool for environmental planning and decision-making.

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Consumer awareness in selecting fashion products in the circular economy

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Abstract

Brands today have an essential role in consumer choices – sometimes creating a dependency beyond product necessity. Fashion companies work continuously with their brands, to get as close as possible to the consumer's tastes and desires, to incite desire even if it's not there, orient it and keep it closer. But are they oriented versus environmental aspects and climate change actions? According to the New Textile Economy report (2017) from the share of clothing that is collected for reuse, less than 1% will be used to make new clothing. So the fashion industry needs to develop sustainable strategies for their markets since their opportunities will be reduced during the next 15 years. But the first step for fashion companies is the awareness of the consumers. Due to this perspective, the main goal of this paper is to analyze the consumer's evaluation of fashion brands. The role of brand awareness is important in understanding the consumer decision-making process.

The study is based on a quantitative field study with quantitative data to test and analyze consumer evaluation of brands. The method is focused on descriptive analytic analysis.

Through the evaluation results, we noticed that consumers are impacted by well-known brands without taking into consideration the effects of climate change.

Keywords: Fashion brands, consumer, circular economy, climate change

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Introduction

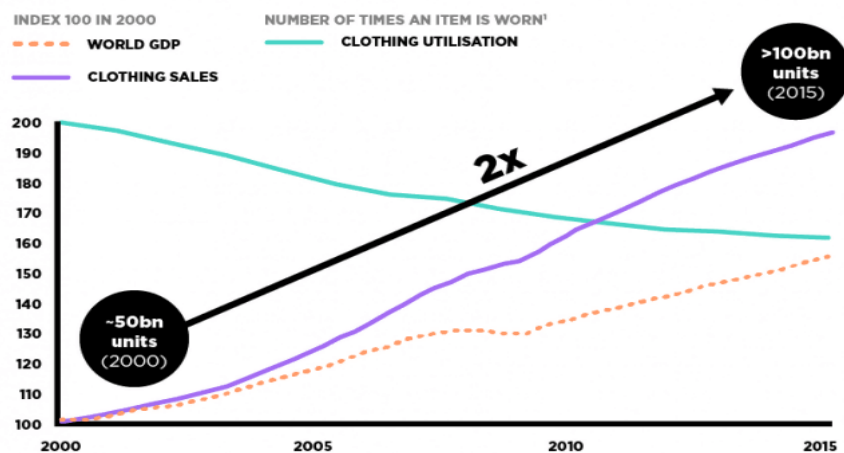
A brand represents a certain category of influence on consumers which indicates that it has a dominant attribute, associations that contribute to its image (Boush and Loken, 1991). It captures the images that consumers have formed through information acquisition and experiential interactions with the brand (Swait et al., 1993). Through brand extensions, the company takes advantage of market growth opportunities and leverages positive brand equity (Martinez and Pina, 2010). Corporate branding strategies are part of the firm's product decision (Gürhan-Canli and Batra, 2004) which together with other marketing decisions contribute to the firm's assets (eg, Aaker and Keller, 1990). Companies communicate and launch new products through one of the following three branding actions: using the parent brand to leverage that brand's value, using a new brand name distinct and separate from the parent brand name, and using both the new brand and the parent brand. (Berens et al., 2005).

Various studies consider the determinants of consumers' brand extension evaluations, showing that category fit is crucial to the success of brand extensions and alliances (Simonin and Ruth, 1998). New product evaluations are lower when its fit with the firm's capabilities is low, i.e., when the firm enters markets (Smith and Andrews, 1995). However, some companies are successful in launching new products with low fit with the parent brand. In this sense, the literature emphasizes the importance of identity similarity and attractiveness in shaping consumer attitudes, preferences and choices (Tajfel and Turner, 1985; Bhattacharya and Sen, 2003). However, the existing literature has not provided a thorough explanation of how and when identification affects brand extension (Gammoh et al., 2006).

Fashion and Circular Economy

Since the industrial revolution, the economy in developed countries but not only is built on the take-make-waste model of a linear economy. This model proved successful for decades as it assisted the growth of many national economies, nowadays, seemed that cannot sustain growth forever, and as brand owners become more aware of the impact production and consumption is having on the environment, many are moving towards a new and more sustainable way of doing business - The circular economy.

Growth of clothing sales and decline in clothing utilisation since 2000



Average number of times a garment is worn before it ceases to be used
 Source: Euromonitor International Apparel & Footwear 2016 Edition (volume sales trends 2005-2015); World Bank, World development indicators - GD (2017)

<https://motif.org/news/circular-fashion-economy/>

Fast fashion is a modern-day phenomenon. It follows a “take-make-dispose” pattern, and enables companies to mass-market, manufacturers to mass-produce, and consumers to purchase the latest trends for cheap. Sounds like a win-win until true costs are disclosed. Textile production has become one of the most polluting industries, producing 1.2 billion tons of CO₂ per year. To keep up with this level of consumerism, natural resources are put under substantial pressure, causing high levels of pollution; including the use of toxic chemicals, dangerous dyes, and synthetic fibers seeping into water supplies and in our ocean. Over 60% of textiles used in the clothing industry are made in China and India, where coal-fueled power plants increase the carbon footprint of each garment.

From the resource perspective, raw materials shortages can impact any form of consumer goods from food shortage due to droughts, to textile demand changing due to the increased need for PPE during the COVID-19 pandemic. Even the supplements industry is not immune to issues.

Supply chain experts are exploring ways to make their individual industries more sustainable and stable, and the circular economy is one good example of how this can be achieved. A recent study from Gartner reports that the circular economy is here to stay, and that over the next two years more companies will make changes to their packaging and supply chains.

For example, if a company is part of fitness-related goods market offer, it's likely that its target audience are becoming concerned not just with their health, but the health of the planet. Anyone cannot ignore sustainability as a concept of business development. The time has come to look at ways to reduce waste in each supply chain, promote re-use, and take steps to impact less and gain more.

The main aim of this paper is to analyze the consumer's evaluation of brands.

The main aim of this paper is to analyze the consumer's evaluation of brands.

The study is based on a quantitative field study with quantitative data to test and analyze consumer evaluation of brands. Finally, we discuss the theoretical findings, drawing conclusions and recommendations.

Purpose of the Study

The main purpose of this paper is to analyze the brands, what they are, the elements, the consumer, the consumer's attraction to the brands and his assessment of them through the questionnaire developed for the period December 2020-March 2021.

The main objectives of this study

- To analyze the basic concepts on brands and the consumer;
- To discover the main factors that influence the growth of brands in the market;
- To examine in general the consumer's evaluation of brands;
- To formulate recommendations after analyzing the survey data from the consumer's evaluation of brands

Research questions

1. What is the role and importance of brands in the market?
2. What does the consumer value in brands?
3. What are the consumer ratings on the brands in the market?
4. What are the best strategies in this regard?

Literature Review

The practice of branding is thought to have started with the ancient Egyptians, who were known to have engaged in branding cattle as early as 2700 BC. If a person stole any of the cattle, anyone else who saw the symbol could identify the real owner.

With time the term has expanded to mean a strategic personality for a product or company, so that "brand" now includes values and promises for emotional arousal a consumer can perceive and buy into.

Over time, the practice of branding objects extended to a wider range of packaging and goods offered for sale, including oil, wine, cosmetics, and fish sauce, and, in the 21st century, extends even further. in services (such as legal, financial and medical services), political parties and people (eg Elon Musk, Lady Gaga, Kardashians and Katy Perry).

In the modern era, the concept of branding has expanded to include the deployment by a manager of marketing and communication techniques and tools that help differentiate a company or products from competitors, aiming to create a lasting impression in the minds of customers. Many companies believe that there is little difference to distinguish between certain types of products in the 21st century, therefore branding is among the few remaining forms of product differentiation (Ranchhod, 2004).

Brand effects

MacInnis and Nakamoto (1990) refer to specific brand association as an attribute or benefit that differentiates a brand from competing brands. Aaker (1990, 1996) finds that brand associations are the category of assets and liabilities of a brand that include everything "associated" in memory with a brand, which facilitates consumers to process, organize and retrieve information to help them make purchasing decisions. According to Fournier (1998), a key determinant of long-term business-consumer relationships depends on how consumers perceive brands. However, understanding consumer perceptions of brands is complex because the multidimensional constructs of brands are very similar to each other (Aaker, 1996; Keller, 1993). In general, researchers divide brand associations into four main dimensions:

1. perceived quality,
2. brand image,
3. brand awareness and
4. brand attitude (Aaker, 1992b; Farquhar, 1989, 1990; Keller, 1993).

Quality has been identified as one of the most important and prominent factors related to the strength of a brand. According to previous studies (Jacobsen & Aaker, 1987; Farquhar, 1990; Zeithaml, 1988), the perceived quality of products and services is central to the theory that strong brands add value to consumers' purchase evaluations. Quality is also strongly related to other key variables such as market share, price and cost (Farquhar, 1990; Hellofs & Jacobson, 1999; Jacobson & Aaker, 1987). Aaker (1990) emphasizes the importance of perceived quality because quality:

1. affects financial performance,

2. is often a key strategic driver of a business and
3. is related to other aspects of a brand's perceptions.

Brand Awareness

The set of consumer evaluations has been considered an important concept for understanding the purchase decision process (eg, Howard & Seth, 1969; Hoyer, 1984; Narayana & Markin, 1975). Consequently, brand awareness is widely recognized as an important concept in consumer behavior, especially in terms of advertising management and brand equity dimension. Keller (1993) asserts that brand awareness is reflected in consumers' ability to identify the brand under different conditions. Therefore, there are two basic approaches to assessing awareness:

1. brand recall which "relates to consumers' ability to recall the brand when given product category, category-met needs, or some other type of cue" (p. 3), and
2. brand recognition which "is related to consumers' ability to confirm prior exposure to the brand when given the brand as a cue" (p. 3).

The Ellen Mc Arthur Foundation book "The Circular Design" brings a new appeal for circular branding – awareness and emotion.

Circular design is about regeneration. This includes thinking beyond just end-of-life solutions, such as turning plastic bottles into T-shirts, to instead move towards actively regenerating local ecosystems and communities. Circularity is about designing for a future where instead of being a source of global challenges like climate change or biodiversity loss the industry can become a solution to those issues – this is the essence of circular economy.

Fashion itself is a huge lever in the overall economy because it affects (emotionally) everyone and impacts the way actors of this industry manage lands and agriculture because of the crops used order to produce fibers. All of the fashion companies embracing the concept of Circular design go beyond designing aesthetically attractive, durable products with materials that are sourced sustainably, and incorporate aspects of community, place and designing for a better system. Is this a new awareness aspect for brands? The examples of important groups like Adidas and Inditex has supported this.

Ugla (2011), defines two types of consumer behavior, dividing them into cognitive orientation and cognitive experience. Consumers who are based on cognitive orientation are rational and logical consumers, while consumers who are based on cognitive experience have more emotional motives for purchasing a product. While Dalvist and Linde (2002), have defined four types of consumers behavior; rational, involuntary, learned and social. These behaviors are oriented by the sequence of three steps which are: knowledge, attitude, and action. Rational behavior. If consumers have a rational behavior, they first acquire knowledge about the product and what the market can offer. By evaluating the information, they create an attitude about the product and further act by buying or not buying the product. This behavior is most observed in expensive purchases (knowledge-attitude-action). Involuntary behavior. When consumers

have an involuntary behavior, they start with an attitude about the product, and the attitude is born out of emotions and feelings. In their attitudes, consumers search for information about the product and from this they obtain information and knowledge, while finally acting on their choice. This behavior is encountered in periods when they have to vote (attitude-knowledge-action). Learned behavior. Reflexes decide on product choice, when consumers choose a product, they do not plan their choice, they do it out of habit. This behavior is encountered when consumers buy newspapers (action-knowledge-attitude). Social behavior. Social behavior occurs when consumers choose a product depending on the social development they live in, their lifestyle, status and the influence of others to decide what product they will choose (attitude-knowledge action) (Edian Balla, 2015).

It's been almost a decade now that consumers are exposed to environmental issues, starting from animal protection (appreciating brands using substitutes of furs and skins) to different fibers substituting wool for high fashion clothing, not testing skincare products on animals and so on. So the product choice based on Involuntary behavior is reduced from a more aware approach without resigning from brands and their appeal.

Research Methodology

3.1. Research methods

In this study we used:

- Descriptive method – this method describes the brand, its evaluation and importance.
- Theoretical Analysis Method – Through this method, the literature of various scientific works necessary for this work was researched. Where we use studies in this field, various reports, reviews of national and international studies.
- Interpretive method – by means of this method, the data extracted through the questionnaire was interpreted.

3.2. Data collection methods and procedure

The present research was carried out by performing the quantitative method. When conducting quantitative research, the aim is to measure general theoretical concepts, through tools such as standard questionnaires.

The standard questionnaire was used to supplement the present research to derive the research results. The choice of this research tool was made, as its structured form makes it easy to use in both administration and analysis. The questionnaire consists of 11 questions, where the answers are explicitly specified.

3.3. Statistical data processing

This paper also used the statistical method, which enabled the collection of data, finding percentages, extracting the average and presenting it in graphs and tabular formats. The collected data were analyzed based on the statistical tool SPSS.

All personal data collected from the questionnaires were used exclusively for conducting the survey and were not disclosed to third parties without the prior consent of the participant.

3.4. samples

The study involves a questionnaire-based survey of various consumers. We do not specify or limit them in areas to enable their wider participation. This form is designed to be inclusive and have a high number of participants.

100 consumers were included in the study. Prior approval has been obtained for each of them. The questionnaire is distributed in different forms. Physically and in print as well as via email and WhatsApp.

Table 1 Descriptive Statistics

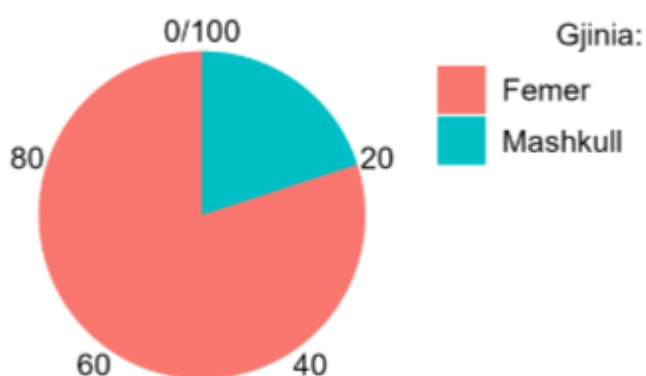
Descriptive Statistics									
	Valid	Missing	Mean	Std. Deviation	Minimum	Maximum			
Gender:	100	0							
When buying a product, you think first the functionality or its brand?	100	0							
When thinking of buying a PRODUCT, in your mind what comes first as a solution – the brand used before, a well-known brand or a brand chosen by others?	100	0							
Which elements impacts your choice and evaluation of a brand?	100	0							
When you want to buy a PRODUCT who makes the decision in your family?	100	0							
Are you exposed to advertising in your	100	0							

social medias? YES/NO									
When you buy a brand, you rely on more at the price; its impact on the community; discounts/ on this brand; its quality.	100	0							
Please value the following from 1 (strongly disagree) to 5 (strongly agree). I choose brands I know well and trust them	100	0	4.920	0.273	4.000	5.000			
I am safer if & choose the well-known brands	100	0	4.200	0.752	3.000	5.000			
I look in the market for known brands before I search for other similar products	100	0	4.360	0.916	2.000	5.000			
If I must choose between a famous brand and a generic product, I will choose the brand.	100	0	5.000	0.000	5.000	5.000			
If my prefer brand is not available, I will not buy the product.	100	0	2.780	1.397	1.000	5.000			
If the brand I like is not available, I will try to find it elsewhere.	100	0	4.720	0.451	4.000	5.000			
How often you choose the brand first when buying	100	0							

Note. Not all values are available for *Nominal Text* variables

Table 7 Frequencies for Gender:

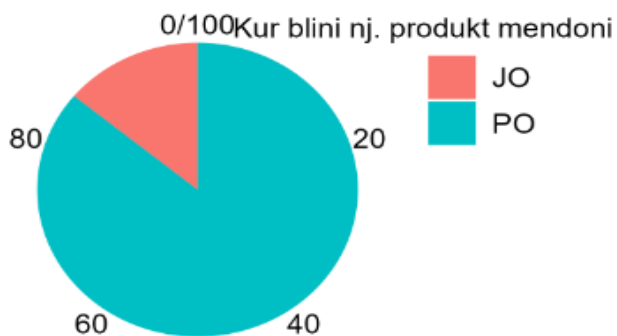
Frequencies for Gender:					
Gender:	Frequency	Percent	Valid Percent	Cumulative Percent	
Female	80	80.000	80.000	80.000	
Male	20	20.000	20.000	100.000	
Missing	0	0.000			
Total	100	100.000			



In this study N=100, where N=86 or 86% think firstly for the brand while buying a product and N=14 or 14% do not think the brand before buying a product.

Table 8 Frequencies for When buying a product, you think first the functionality or its brand?

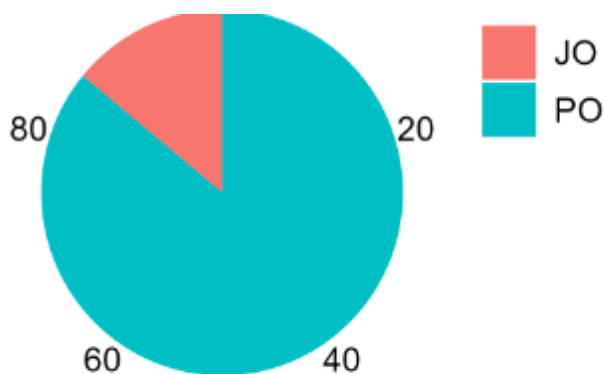
Frequencies for When buying a product, you think first the functionality or its brand?					
When buying a product, you think first the functionality or its brand?	Frequency	Percent	Valid Percent	Cumulative Percent	
NO	14	14.000	14.000	14.000	
Yes	86	86.000	86.000	100.000	
Missing	0	0.000			
Total	100	100.000			



In this study N=100, N=86 or 86% while buying a product think of a brand chosen before, or a well-known brand/ chosen by others and N=14 or 14% do not think while buying a product.

Table 9 Frequencies for when thinking of buying a PRODUCT, in your mind what comes first as a solution – the brand used before, a well-known brand or a brand chosen by others?

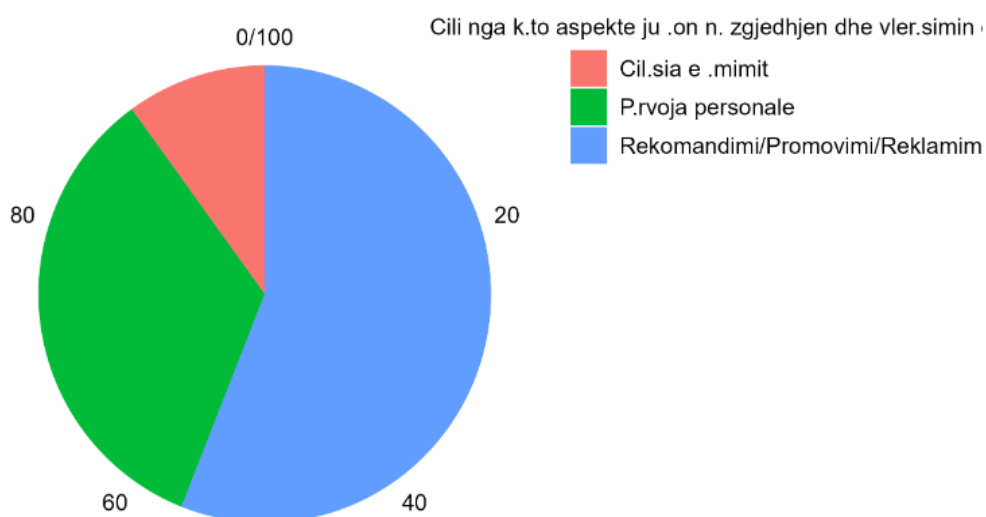
When thinking of buying a PRODUCT, in your mind what comes first as a solution – the brand used before, a well-known brand or a brand chosen by others?	Frequency	Percent	Valid Percent	Cumulative Percent
NO	14	14.000	14.000	14.000
YES	86	86.000	86.000	100.000
Missing	0	0.000		
Total	100	100.000		



In this study N=100, N=56 or 56% value more recommendation/promotion/advertising while choosing a brand, N=34 or 34%, value the brand of a personal choice and N=10 or 10% value more the quality.

Table 10 Frequencies for Which elements impacts your choice and evaluation of a brand?

Frequencies for which elements impacts your choice and evaluation of a brand?						
Which elements impacts your choice and evaluation of a brand?	Frequency		Percent	Valid Percent	Cumulative Percent	
Quality of the price	10		10.000	10.000	10.000	
Personal experience	34		34.000	34.000	44.000	
Recommendation/Promotion Advertising	56		56.000	56.000	100.000	
Total	100		100.000			

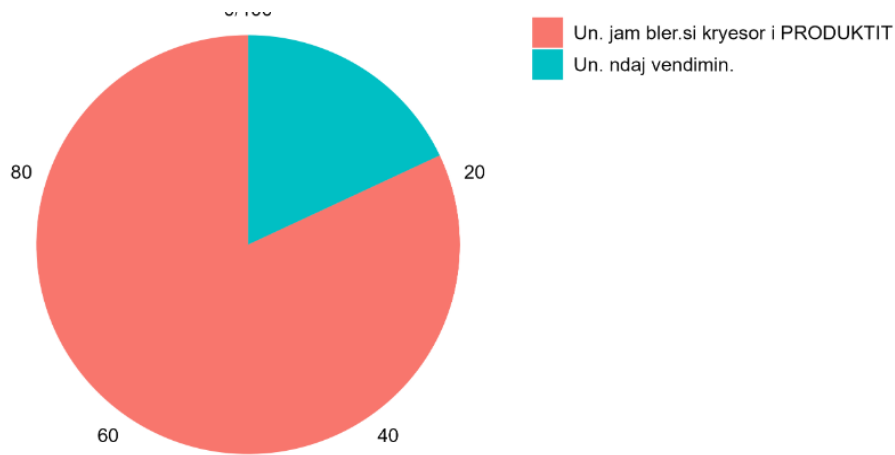


In this study N=100, N=82 or 82% of people are first shoppers of brands and N=18 or 18% think differently.

Table 11 Frequencies for When you want to buy a PRODUCT who makes the decision in your family?

Frequencies for When you want to buy a PRODUCT who makes the decision in your family?					
When you want to buy a PRODUCT who makes the decision in your family?	Frequency	Percent	Valid Percent	Cumulative Percent	
I am the main buyer of the PRODUCT	82	82.000	82.000	82.000	
I share the decision	18	18.000	18.000	100.000	

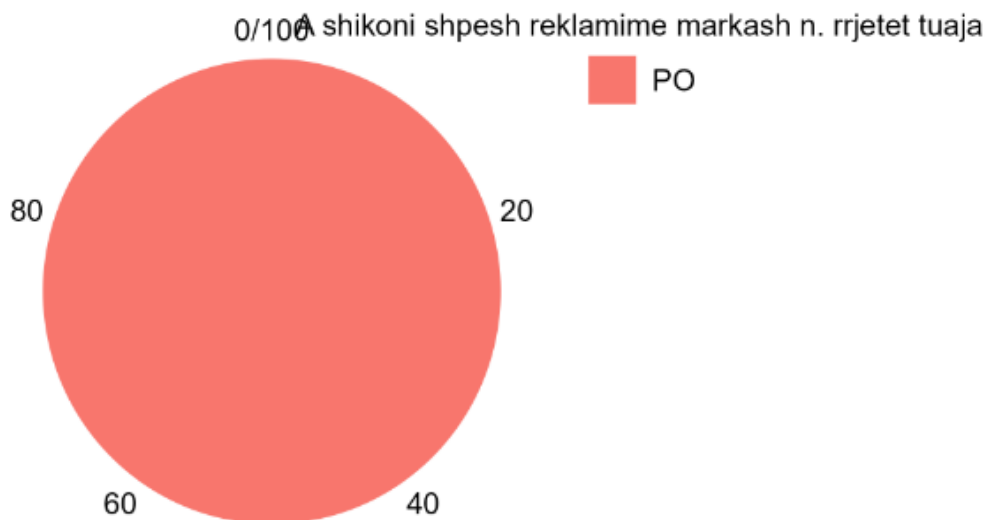
Missing	0	0.000				
Total	100	100.000				



In this study N=100, and N=100 or 100% do follow advertising in their social media channels and are affected by them.

Table 12 Frequencies for Are you exposed to advertising in your social medias? YES/NO

Frequencies for Are you exposed to advertising in your social medias? YES/NO						
Are you exposed to advertising in your social medias? YES/NO		Frequency	Percent	Valid Percent	Cumulative Percent	
YES		100	100.000	100.000	100.000	
Missing		0	0.000			
Total		100	100.000			



In this study N=100, N=40, or 40% base the brand preference into price, N=34 or 34% base the brand preference into quality, N=16 or 16%,from its impact into community and how advertisable it is, and N=10 ore 10% on sales that this particular brand applies.

Table 13 Frequencies for When you buy a brand, you rely on more:

Frequencies for When you buy a brand, you rely on more:					
When you buy a brand, you relay more	Frequency	Percent	Valid Percent	Cumulative Percent	
At the price	40	40.000	40.000	40.000	
At the quality	34	34.000	34.000	74.000	
Its impact on the community	16	16.000	16.000	90.000	
Discounts/ on this brand	10	10.000	10.000	100.000	
Missing	0	0.000			
Total	100	100.000			



Question 9, relates to 6 answers with a Likhert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The highest rating is the statement “When given the choice between brands and a generic version, I would choose the brand” with a rating of 5 and the lowest rated statement of 2.78 is “If the brand I prefer is not available, I will not to buy another brand”. The summary table is presented as follows:

Please rate the following from 1 (Strongly disagree) to 5 (Strongly agree). I buy brands that I know are reliable and value them more.	100	0	4.920	0.273	4.000	5.000
I am confident when I buy brands.	100	0	4.200	0.752	3.000	5.000
I look for brands I know before I look for other versions of this product.	100	0	4.360	0.916	2.000	5.000
When given the choice between brand name and a generic version, I would choose the brand name.	100	0	5.000	0.000	5.000	5.000
If the brand I prefer is not available, I will not buy another brand.	100	0	2.780	1.397	1.000	5.000
If the brand I like is not available, I will try to find it elsewhere.	100	0	4.720	0.451	4.000	5.000

In summary, each statement is given:

The statement "I buy brands that I know are reliable and I value them more", was rated 5 out of N=92 and N=8 rated 4.

Table 14 Frequencies for Please rate the following from 1 (Strongly Disagree) to 5 (Strongly Agree). I buy brands that I know are reliable and value them more.

Frequencies for Please rate the following from 1 (Strongly Disagree) to 5 (Strongly Agree). I buy brands that I know are reliable and value them more.						
Please rate the following from 1 (Strongly Disagree) to 5 (Strongly Agree). I buy brands that I know are reliable and value them more.		Frequency	Percent	Valid Percent	Cumulative Percent	
4		8	8.000	8.000	8.000	
5		92	92.000	92.000	100.000	
Missing		0	0.000			
Total		100	100.000			

The statement "I am confident when I buy the brand" was rated by N=40, 5 and N=40 rated it as 4 and N=20 rated it as 3.

Table 10 Frequencies for . I am confident when I buy brands.

Frequencies for I am confident when I buy brands.						
I am confident when I buy brands		Frequency	Percent	Valid Percent	Cumulative Percent	
3		20	20.000	20.000	20.000	
4		40	40.000	40.000	60.000	
5		40	40.000	40.000	100.000	
Missing		0	0.000			
Total		100	100.000			

The statement "I search for brands I know before I search for other versions of this product" was rated by N=58, 5 and N=28 rated it as 4, N=6 rated it as 3 and N=8 , have rated with 2.

Table 11 Frequencies for I look for brands I know before looking for other versions of this product.

Frequencies for I look for brands I know before looking for other versions of this product.						
I look for brands I know before looking for other versions of this product.	Frequency	Percent	Valid Percent	Cumulative Percent		
2	8	8.000	8.000	8.000		
3	6	6.000	6.000	14.000		
4	28	28.000	28.000	42.000		
5	58	58.000	58.000	100.000		
Missing	0	0.000				
Total	100	100.000				

The statement "When given the choice between brands and a generic version, I would choose the brand", is rated 5, for N=100.

Table 12 Frequencies for When given the choice between brands and a generic version, I would choose the brand.

Frequencies for When given the choice between brands and a generic version, I would choose the brand.						
When given the choice between brands and a generic version, I would choose the brand.	Frequency	Percent	Valid Percent	Cumulative Percent		
5	100	100.000	100.000	100.000		
Missing	0	0.000				
Total	100	100.000				

The statement "If the brand I prefer is not available, I will not buy another brand", was rated by N=14, 5 and N=20 rated it as 4, N=22 rated it as 3, N=18, rated 2 and N=26 rated 1.

Table 13 Frequencies for If the brand I prefer is not available, I will not buy another brand.

Frequencies for If the brand I prefer is not available, I will not buy another brand						
If the brand I prefer is not available, I will not buy another brand	Frequency	Percent	Valid Percent	Cumulative Percent		
1	26	26.000	26.000	26.000		
2	18	18.000	18.000	44.000		
3	22	22.000	22.000	66.000		
4	20	20.000	20.000	86.000		
5	14	14.000	14.000	100.000		
Missing	0	0.000				
Total	100	100.000				

The statement "If the brand I like is not available, I will try to find it elsewhere", was rated by N=72, 5 and N=28 rated 4.

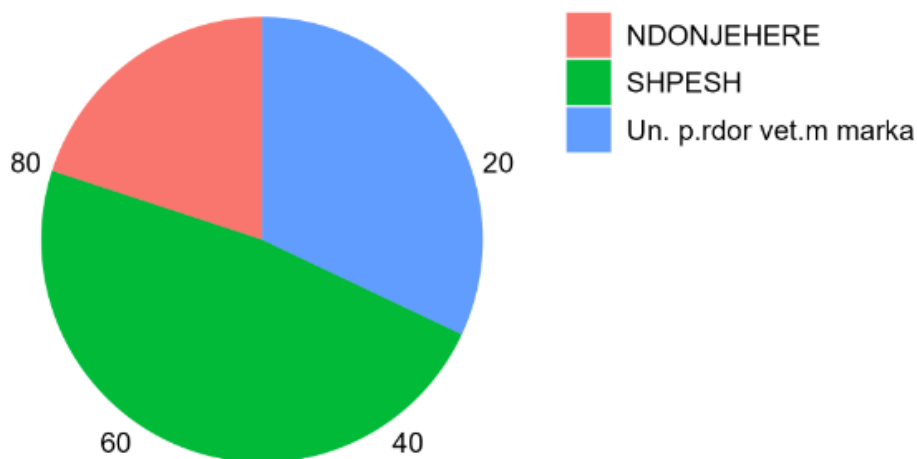
Table 14 Frequencies for If the brand I like is not available, I will try to find it elsewhere.

Frequencies for . If the brand I like is not available, I will try to find it elsewhere.						
If the brand I like is not available, I will try to find it elsewhere.	Frequency	Percent	Valid Percent	Cumulative Percent		
4	28	28.000	28.000	28.000		
5	72	72.000	72.000	100.000		
Missing	0	0.000				
Total	100	100.000				

In the study N=100, we have N=48 or 48% have frequent use of brands, N=32, or 32% have only brand use and N=20 or 20% sometimes use brands.

Table 15 Frequencies for How often do you use the brand in the things you buy?

Frequencies for How often do you use the brand in the things you buy?						
How often do you use the brand in the things you buy	Frequency	Percent	Valid Percent	Cumulative Percent		
SOMETIME	20	20.000	20.000	20.000		
OFTEN	48	48.000	48.000	68.000		
I only buy brands	32	32.000	32.000	100.000		
Missing	0	0.000				
Total	100	100.000				



In the study N=50, we have N=100 or 100% are influenced by the external appearance or how much the brand improves their appearance in their evaluation of the brand.

Conclusions

The study showed that consumers liked the brands. Their evaluation against brands and their likeability is done for different reasons from consumer to consumer.

The results showed that:

- We have full participation of all those present in the study. Most of them were female.
- The study showed that before buying a product, the consumer first thinks about its brand. A very small part of him was disinterested about the brand. This shows that today the brand has a wide impact in the community and that it is taken into account by the largest part of the purchase of their daily products.

-Usually consumers were directed to the brands that they have used before or that is very heard/used by others. The impact that a well-known and well-known brand has, is clearly visible, so that the consumer is directed towards it.

- In the study it was shown that the majority evaluate the Recommendation/Exam/Advertising when choosing a brand, and the smaller part evaluate a brand when they choose it from personal experience or for its quality. Seeing that the highest number is influenced by the impact that the brand has, by the suggestions that come from well-known bloggers, by social networks, by the company's promotions and advertising, the evaluation for these brands is higher compared to others. It is evident that we live in a community where the promotion and advertising of the product leads to an increase in the number of customers and sales.

- The study showed that we have more participants who make decisions on purchasing brands by themselves without being influenced by others or family members.

- All the participants stated that they often see brand advertisements on social networks and they are influenced by them.

- When buying a brand, most of the study was based on the price, the rest on its quality, on its impact on the community and how advertisable it is, and on the discounts/reductions the brand offers.

The highest brand-related rating resulted in the statement "When given the choice between brands and a generic version, I would choose the brand" with a rating of 5 and the lowest rated statement of 2.78 is "If the brand I prefer is not available, I will not buy another brand". This shows that the consumer would always choose the brand over other products. Briefly, each statement is given:

- The statement "I buy brands that I know are reliable and I value them more", was evaluated with N=92, 5 and N=8 evaluated with 4.
- The statement "I am confident when I buy a brand", was rated by N=40, 5 and N=40 rated it as 4 and N=20 rated it as 3.
- The statement "I search for brands that I know before I search for other versions of this product", was evaluated with N=58, 5 and N=28 evaluated with 4, N=6 evaluated with 3 and N= 8, have rated with 2.
- The statement "When given the choice between brands and a generic version, I would choose the brand", is rated 5, for N=100.
- The statement "If the brand I prefer is not available, I will not buy another brand", was rated by N=14, 5 and N=20 rated it as 4, N=22 rated it as 3, N=18 , rated 2 and N=26 rated 1.
- The statement "If the brand I like is not available, I will try to find it somewhere else", was rated by N=72, 5 and N=28 rated 4.

The study shows that we have the frequent use of brands by consumers and that they are influenced by the external appearance or how much the brand improves their appearance in their assessment of the brand.

Recommendations

The market offer and the customer's evaluation of these products is essential in the business progress. Marketing planning begins with the construction of an offer that brings value to the target customers, where these offers also increase its value. So marketers can build the offer based on a circular design approach to accompany their customers to smart choices. This offer becomes the basis on which the company builds profitable relationships with consumers. Many companies have moved to a new level in creating value for their customers, by differentiating their offerings, they are creating and managing customer experiences with their brands and companies.

Brand assessments should clearly identify: what you are doing to support improvements in brands reputation; what people think of the brand and how this is affected by a company activities; how they are positively impacting your business and how you can do more. Knowing all these areas helps target spending and guide strategies in a way that minimizes problems and dissatisfaction and maximizes profit and customers.

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Smart and Sustainable Upgrade of Municipal Solid Waste Management; the case of Saranda, Albania

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Abstract

Solid waste is a vital responsibility of the municipal government and one of the greatest challenges urban authorities are facing today, with the amount of waste generated exceeding both their technical and financial capacity to collect and dispose.

Integrated solid waste management is a determinant factor for the protection of the environment and the health of the residents while contributing to the overall municipal budget. It relates to a range of issues of urban lifestyle, such as consumption, employment and income of residents as well as other socio-economic and cultural factors. In the case of tourism destinations, the rendering of such services becomes even more complex.

The paper presents a scanning of these services rendered by the municipality of Saranda, a Mediterranean coastal resort town in Albania, and the analysis of the SWM performance indicators.

As the territory faces seasonality, it naturally turns to smart management systems and models to acquire solutions and sustainability. The paper strives to identify the benefits and constraints of sustainable solid waste management systems and offers recommendations.

Keywords: Municipal Solid Waste, Sustainable Management, performance indicators, Saranda, Albania

Jel Code: Q53

Introduction

Municipal solid waste management (MSWM) is one of the most important public services that provides better protection of the environment and the health of the residents as well as contributes to the overall municipal budget. It relates to a range of issues of urban lifestyle, consumption, employment and income of residents as well as other socio-economic and cultural factors.

The rendering of MSWM services is of strategic importance for tourism destinations in particular. Since 1994, the collection, transport and other cleaning services in Albania have been delegated to local authorities, making them fully responsible for their management.

In 2016, there were 1,503,386 tons of municipal waste, 373 kg/inhabitant/year or 1,022 kg/inhabitant/day. In contrast to the policies of European Union countries and countries in the region, the current waste management systems used today in the country consist of collecting municipal solid waste in one direction and transporting them to open local landfills.

The Municipality of Saranda is a popular yet highly seasonal tourist destination in Southern Albania. A second-level administrative division within the Republic of Albania, it is one of the 7 municipalities constituting the County of Vlorë, the second most populous after the homonymous municipality and is well connected to the national highway network. The main source of income is tourism however, the geographical position is very favorable to agriculture, fishing and livestock.

This rich archaeological and natural heritage as well as its natural harbor, constitutes the most important basis for promoting the development of the current image of Saranda as a destination of classic world tourism.

Butrint National Archaeological Park is the primary generator of international tourists. Despite that Saranda still has problems with water supply, wastewater, urban waste management, as well as marine waters or numerous coastal territories. Environmental issues in Saranda are related to coastal construction and the creation of hot spots from waste collection in unauthorized areas. In recent years, rapid urban development trends have resulted in the city expanding along the coast leading to a chaotic development.

The presence of ports in Saranda and the increase of tourist arrivals has led to an increased number of fishing boats, passenger boats and freight ships operating in the area with a negative impact on the environment due to the amount of oil discharged into the marine environment. This is often paired with the breaking down of the sewage pipes causing the sewage to be discharged into Bistrica River.

According to the 2011 Census, it has a population of 20,227 inhabitants, while the civil registry has a record of 54,630 inhabitants. The municipality territory has extended to an area of 58.96 km² after the 2015 territorial reform thus the population density according to the census is 343 inhabitants / km² while according to the civil registry it is 859.56 inhabitants / km².

Owing to its relatively small size, combined with a large concentration of population within its urban core, Saranda is also Albania's 4th most densely populated municipality with 241.6 residents per square km². The town's seasonal growth in population, overwhelms the Municipality's waste collection capacity, thus exacerbating its waste collection and management problem. As a typical MED tourist territory, its carrying capacity is often counterposing interests of tourist stakeholders and local communities. For many years Saranda sits under the pressure of a constant increase of municipal solid wastes, a fact that poses a major challenge to the daily management of the territory and as Albania aspires to join the EU waste management principles are a key element underpinning efforts towards sustainability.

Bajkaj sanitary landfill in Saranda is one of the operational landfills of Albania that can be considered controlled landfills. An analysis of the use of the Bajkaj landfill by the 5 municipalities shows that separation at source and landfill disposal is a very efficient way of integrated waste management.

The Government of Albania's 2017-2022 program stipulated that the treatment of waste as raw materials will be done in accordance with the concept of systems of circulating economies, by efficiently using raw material resources. Planning an effective reduction, reuse and recycling system requires a different analysis and approach by the current system. Decisions about waste collection, marketing, recycling process and management, regardless of the public (citizens, families and businesses), have led to an ineffective program, and to date, very expensive, should the health consequences of citizens be considered.

Waste separation projects at source, mostly promoted by CSO's, are expected to help the economy ensure amounts of recycled materials, and reduce the amount of waste at the landfill. On the other hand, the building and promoting of incinerators is not what the law and strategy approve as the best way to clean up the country. Unachieved recycling objectives of the waste management programs, both by central and local Albanian decision-makers and by international organizations based in Albania, serve as an indicator of inconsistent planning in terms of benefit and support of the community.

This paper considers economic, technical and organizational factors that enable an up-to-date Municipal Solid Waste Management for the territory of Saranda by examining the Municipality's solid waste collection and management capacity.

Literature review

The underlying cause of the majority of environmental issues facing the modern world is waste pollution, which is deeply rooted to industrial activity (Hadjibiros, 2000).

In the post-industrial era, technology will be extensively used to mitigate these environmental issues with the objective of diminishing, if not eventually eradicating, waste disposal and implementing contamination control strategies (Stegmann, 2006).

The European Union (EU) has greatly encouraged zero-waste emission and, generally, a zero-waste approach via the establishment of an upgraded environmental policy and applicable laws.

A favorable technological approach is the total evaluation of waste by converting it into usable unprocessed materials or energy. Contemporary technology offers effective options for integrating liquid waste into the cycle of natural water (Steinfeld and Del Porto, 2007).

Besides from financial contributions in the form of taxes or levies to fund the expenses of building and running such institutions, this particular approach does not call for active engagement from the public at large. Given the wide variety of solid waste, MSW has fewer technological advanced solutions.

The utilization of an "ideal machine" is the best technological solution to the MSW challenge as it could precisely and effectively sort heterogeneous MSW into an assortment of categories, allowing it to ultimately recognize as "clean" the substances without leaving any waste in the process.

Nevertheless, active public engagement is required to guarantee MSW valorization in lack of certain technological advances (Haferkamp et al, 1997). Only after effective categorization at the origin occurs can substance restoration be done effectively. In the On EU Region, legislative measures based on the foundations of developing European environmental policy are aimed at issues with MSW management. The polluter tax and pollution prevention concepts are the fundamental principles of contemporary environmental policy. Such ideals are reflected in the European Directives for MSW management (Pretz et al, 2001), which are some innovative illustrations of environmental policy.

As a result of the complex managing processes utilized by the European Union, which typically encourage agreements between conflicting movements, these guidelines have evolved to be acknowledged. Since the accountable organizations approved of these regulations, it demonstrates the current degree of unity and indicates that significant progress has been made toward the political aim of enhancing environmental quality. As a result, Europe is currently ready for a waste-based strategy to the sensible management of natural resources. Local

communities, on the contrary, are not entirely persuaded to tolerate interference from MSW units in their region by insufficient justifications. Unfavorable social reactions raised against the positioning of a landfill or a mechanical filtering station in certain regions represent a significant truth that must be regarded as a significant consideration and adequately addressed in preparing and decision-making procedures.

The situation regarding MSW management in Albania is also worth considering. The primary method for handling MSW is the proper disposing of it in open dumping sites scattered throughout the nation (Alcani M. et al, 2010).

The NES is a plan of action that will help Albania get closer to achieving the environmental conditions needed for EU membership. It involves all methods to ensure that everyone has access to clean drinking water and minimizes the danger to human health. Although there is a detailed legal framework regarding this subject, it is frequently not implemented despite objectives made every year to optimize management of waste. As a result, the situation of management of solid waste in Albania is not ideal, and it currently appears that the sole option for disposing of MSW is dumping it in open landfills.

Currently the municipalities are striving to provide a quality and affordable service as well as to provide minimum waste treatment conditions.

The service in municipalities is underpinned by National Strategy for Integrated Waste Management. Drafted for the first time in 2010 this strategy is the main planning document in the domain of municipal, non-municipal and hazardous waste management which offers models of management of this service.

The strategy offers practical solutions for the specific obligations arising from the legal framework on integrated waste management (Law No. 10 463, dated 22.9.2011 "On integrated waste management", as amended) and all CMDs techniques that complement the regulatory management framework in Albania.

The main principle for waste management defined in this law is waste hierarchy and its implementation as per the following steps.

1. Prevention;
2. Reuse;
3. Recycling;
4. Recovery;
5. Final treatments;

Clearly these steps indicate that waste disposal and final treatment is a problem as important as their collection.

Tools and methodology

The sustainability of MSWM is achieved only if municipalities have the necessary technical, organizational and financial resources, therefore the methodology of this paper is based on the analysis of Saranda's cleaning service contract, its implementation for some of the items.

It performs a financial analysis of the service, and provides separate and comparative performance indicators.

Law no. 139/2015 "On Local Self-Government", Article 33, stipulates the "Instruments for the administration of public services" and instructs local governments to design and adopt the necessary local regulatory framework. The framework includes the National Urban Solid Waste Management Plan as well as the various regulations that define the waste management processes and facility, describe the indicators, specify criteria and instruct local structures in fulfilling tasks and functions as well as in resolving problems that may arise.

Based on these instruments this paper introduces some of the performance indicators of waste management services measured at local level.

The indicators are qualitative and quantitative and are supported by data collection and analysis. This data was obtained from sources such as questionnaires / surveys, field observation reports, technical reports, performance monitoring systems, inspection activities carried out with municipal staff and residents. Performance indicators are grouped into 3 categories consisting of:

1. Quality of service (waste collection efficiency; cleanliness; public perception);
2. Environmental sustainability (degree of differentiation; protection of natural resources);
3. Economic and financial sustainability and institutional aspects and (cost recovery; fee collection; transparency of billing).

MSW in Saranda like all over the country consists of a diverse mixture of refuse comprising organic waste, plastics, metal, paper, hazardous and biohazardous components and debris among others. Recycling of plastic, paper, aluminum, other metals and glass, usually without pre-separation, has not systematically taken place.

The monitoring in the municipality of Saranda was extended to 5 months, where during the first month the documentation of the municipality regarding the service was collected and consulted, as well as other reports that the municipality makes to the relevant institutions.

The monitoring process consisted of field observation of urban waste collection points in cities and Administrative Units; frequency of emptying the bins, cleaning around them, disinfecting them, the condition of the bins and cleaning the city streets.

Finally, a SWOT Analysis was produced based on a questionnaire conducted with the administrative staff employed in the Directorate of Public Services the relevant sector at the Municipality of Sarandë. The main purpose was to assess the state of existing municipal MSW management systems and structures in Sarandë.

(iv) Analysis of environmental, economic and service performance indicators

The quality characteristics and the composition of the MSW, are one of the most important parameters in the design of their various management methods and are generally influenced by numerous factors such as:

The urban character of each area (urban, industrial, rural, tourist, etc.). For example, tourist areas contain larger quantities of packaging materials compared to MSW non-tourist areas.

The climate and the season. In winter, for example, the composition of MSW contains quantities of combustion residues (ashes) from the heating stoves (fireplaces) in contrast to the summer months when there is a complete lack of them.

The type of residence (detached houses with large uncovered areas and gardens, apartment complexes, etc.) as well as the economic and social standard of living of the residents.

The packaging materials of the products used/consumed.

On the other hand, the quality characteristics of MSW are a dynamic parameter and show both geographical and temporal variations. Geographically, the quality composition of MSW can vary considerably from country to country, but also within the same country from prefecture to prefecture and from city to city. Over time, the composition of MSW changes from year to year, from month to month but even from day to day within the same week.

This is because many factors are involved in the consumption and dietary habits of the inhabitants of an area, the types of packaging used and all their activities. So e.g. MSWs in our country show a significant increase in the percentage of their fermentable fraction and consequently the moisture content during the summer months, due to the increased consumption of fruits and fresh vegetables.

In general, MSWs are a particularly heterogeneous patchwork of a variety of materials. The basic fractions of MSW, which express their qualitative characteristics, include specific groups of materials. The composition of the MSW varies depending on the area examined each time as well as the time that the sampling takes place and then their qualitative analysis. Below, is a quality recommendation of MSW for the Region of Epirus, Greece according to a study of quality recommendation, which was made in 2009. As such data is not available for the Municipality of Sarandë, or the County of Vlorë in general, it is assumed that such recommendations would be similar for the above-mentioned areas, due to their geophysical and demographical similarities.

Table 1. *Quality Recommendation of MSW for the Region of Epirus, Greece, 2009*

Ingredient Type	Percentage in MSW (% cc.)
Fermentable	43,14%
Paper, cardboard	18,68%
Metals	5,10%
Plastic	11,94%
Wood	2,98%
Glass	3,82%
Others	14,34%
TOTAL	100%

Source: www.epirus.gov.gr Based on the quantitative aspect of MSW's characteristics, the production rate is dictated by a multitude of factors, of which the most relevant are the following:

Population density (an increase in population density is usually associated with an increase in MSW generation rate for that area);

Seasonality and population fluctuations (especially in areas overcrowded by tourists);

Frequency of collection (an increase in the frequency of collection is generally associated with an increase in MSW production rate);

Socio-economic factors (including cultural traits and education level/background);

Diet and other eating-related habits;

Area of geographical reference;

Age of consumers;

Concentration of industrial activity;

Commercial links;

Effectiveness of the implementation of recycling and composting programs;

Waste and sanitation infrastructure and technology;

Information channels and awareness of the local populace;

Collection points and their capacity;

Exploration of other possibilities for the disposal and/or processing of MSW.

Prior to scanning the services an assessment of the regulatory framework in place was conducted and the main conclusions are presented below:

Despite the fact that the Law No. 10 463, dated 22.9.2011 "On integrated waste management" instructs local governments to design and adopt the necessary local regulatory framework in order to include Urban Solid Waste Management Plan as well as the various regulations that define the waste management processes and facility, describe the indicators, specify criteria and instruct local structures in fulfilling tasks, functions and in resolving problems that may arise, the municipality of Saranda demonstrates lack of such a basic instrument and overall lack of plans for integrated municipal waste management.

In particular, the Waste Tariff Specified Revenue Budget Plan, a document that represents a long-term municipal cost recovery policy, tariff level and collection system aiming to establish an effective system for covering the cost of waste management service is also absent. To date, the municipality of Saranda has not worked on calculating the cost of waste management services.

Monitoring the quality of service indicators, the main conclusion drawn is that the service territorial coverage of the jurisdiction pertaining to sanitation services is extensive; however, other official Municipality sources also express that there are areas in which such coverage is limited to non-existent, especially those situated at the higher-altitude parts of the town.

Sanitation services in the municipality appear ineffective in two major ways:

1. the picking up of litter accumulated on the streets not being performed accordingly;
2. the collecting of the garbage at authorized disposal spaces is usually non-exhaustive as garbage is accumulated elsewhere too.

From stakeholders' meetings other main problems encountered relate to:

- Insufficient collection and disposal of waste and the limited amount deposited and treated at landfill. Despite the operationalization of the Bajkaj landfill in 2015, the disposal of waste at unauthorized spaces continues unabated to this day, and is mostly performed by private businesses, especially construction companies.

- Increasing amounts of debris and green waste;
- Limited number of containers; The number of containers and their estimated capacity does not cover the rate of urban waste generation.
- Lack of waste separation at source and low recycling capacity.

There is no recycling strategy in place for the Municipality of Sarandë

- Cost recovery from the tariff, but also lack of methodology of calculating the tariff;
- Weak familiarization of citizens with tariffs;
- Weak contractual terms, rendering them unenforceable;
- Low transparency in the cleaning service and familiarization of citizens with tariffs;
- Lack of proper environmental education programs;
- Reliability of the data on waste generated, collected and treated in the territory.

Environmental sustainability category of indicators considers various sources of information produced at central and local level and the main outcomes are presented below.

According to the Strategic Environmental Assessment conducted for the Sector Study for Investment Demand in Integrated Solid Waste management in Albania 2018, the improper disposal of waste remains the most serious problem of the Solid Waste Management (SWM) in Albania. It clearly reflects the poor operation of dumpsites, but not only that. Various projects implemented recently focused on the improvement of the landfills in the country, e.g sanitary landfills based on the standards of the EU Landfill Directive. These landfills serve several municipalities as regional facilities.

In the case of Saranda, Bajkaj Sanitary Landfill is designed to serve a catchment area of the southern part of Vlore. The waste amounts currently received at the landfill are less than half of the originally planned amounts, therefore unit costs are higher than expected.

Obviously subsidizing the operations is the only way to finance the landfill which consists of a public service company “Bajkaj Land” Sh.a, established under the care of the Ministry of Urban Development by Decision Nr. 39, 11/11/2014, of the Regional Council of Vlorë.

A primary assessment of environmental effects has been attempted and conducted led by the principle of harmonization with environmental objectives, targets and indicators set at national level.

To begin with, key environmental characteristics and issues relating to the Waste Management Plan, specific to the Municipality of Sarandë were identified. This information was used to set out a series of draft SEA objectives, indicators and associated targets, generalized at the national level for the SEA study to predict the likely environmental effects of the future Waste Management Plan.

Set out in the following table are the draft SEA objectives that should be considered in a future Waste Management Plan. The assessment criteria are examples of the issues that shall be taken into account.

Draft SEA objectives should be considered in any future solid waste management plan, not solely restricted to the Municipality of Sarandë.

It is of quintessential importance they are aligned with relevant environmental regulation, objectives and targets, at the national level. The expected environmental impacts of the respective measures will be crucial for the suggestions relevant for subsequent investment planning.

Table 1: SEA environmental objectives

SEA topic	Environmental objectives	SEA targets
Population and human health	Protection and improvement of human health	Improvement of quality of life Protection of human health
Biodiversity, flora and fauna	Protection of biodiversity Protection of flora and fauna and their natural habitats	Protection of natural and biological resources Protection of protected areas and their natural resources

Source: Ministry of Infrastructure (2018)

Soils and land use	<p>Preservation of healthy and ecological functions of soil</p> <p>Prevention of soil damage incl. protection of soil structure (erosion, soil compaction)</p> <p>Remediation and restoration of damaged soil</p>	<p>Preservation of healthy and ecological functions of soil</p>
Material assets	<p>Prudent and rational use of nature and its resources</p>	<p>Reduction of the use of resources and improving the efficiency of such use</p> <p>Responsible utilisation of natural resources</p>
Water	<p>Good ecological status of surface water as well as groundwater</p> <p>Good chemical status of surface water as well as groundwater</p>	<p>Protection of surface water as well as groundwater and improvement of its ecological status</p> <p>Protection of surface water as well as groundwater and improvement of its chemical status</p>
Air quality and climatic factors	<p>Protection and preservation of air quality</p> <p>Prevention and reduction of pollution causing ozone layer damage and climate change</p>	<p>Reduction and stabilization of green house gas emissions</p> <p>Protection and improvement of air quality</p>
Architectural, archaeological and cultural Heritage	<p>Preservation of cultural heritage</p>	<p>Conservation and protection of the assets of cultural heritage</p>
Landscape	<p>Preservation and restoration of cultural and aesthetic landscape values</p>	<p>Preservation of landscape diversity</p>

Based on a 20+ year waste generation and collection forecast made for the county of Vlora against the summarized country level with reference to the same years as the population forecast, major conclusions drawn are presented below.

The main reason why waste amounts collected differ from the amounts generated, is because waste collection services do not cover all areas, agricultural areas in particular. It is therefore expected that the collection coverage will increase by 3% in agricultural areas and by 1% in all other areas each year.

Both the amount of waste generated and collected are forecasted to increase over the entire period.

The driving forces for the increased generated waste amounts are exclusively the regions in which the country's major urban centers are located, namely Tiranë, Durrës and Vlorë.

The forecasted increase in the collected waste amounts, on the other hand, is due to an assumed general improvement in waste collection.

Collection services still fail to cover all settled areas despite the progress that Saranda has made in waste management recently with the environmental and health impacts of the present SWM system being significant. Whereas the city center generally is fairly clean, alongside roads and in the outskirts scattered waste, as well as piles of waste and especially building rubble, can be seen. Reasons for the unsatisfactory situation are manifold, including poor condition and insufficient number of waste collection equipment (vehicles and containers). Particular SWM activities that lead to environmental shortfalls are identified as:

Poor waste collection rates

Poor recycling rates and lack of separate collection (incl. organic waste fractions)

Disposal on poorly managed or uncontrolled dumpsites

As part of the SEA process an assessment of different technology options for waste management have been considered under the following aspects due to the strategic nature of Waste Management Plans and the far reaching effects:

- Implications of policy and regulation framework
- Identification of policy conform and proven technology options
- Financial feasibility of proven technology option

The main focus was on the identification and selection of proven technologies and the consideration of the financial feasibility. Emerging waste to energy technologies, such as gasification and pyrolysis, have been well known processes for a long time, but only for well-defined feedstock like coal or wood. The experience with respect to the treatment of municipal waste is still very limited. It can be summarized that gasification, pyrolysis, plasma treatment and waste to diesel are not long-term proven technologies for municipal waste treatment and therefore are not considered.

Table 2: Population, Waste Collection and Waste Generation Forecast

County	Population Forecast			
	2018	2022	2027	2032
Vlorë	247,774	250,328	254,065	258,418
ALBANIA	3,347,364	3,371,954	3,416,451	3,476,438

County	Waste Generation Forecast [Mg/a]			
	2018	2022	2027	2032
Vlorë	73,512	74,551	76,005	77,641
ALBANIA	940,376	955,819	979,173	1,007,159

County	Waste Collection Forecast [t/a]			
	2018	2022	2027	2032
Vlorë	54,544	59,603	66,147	72,659
ALBANIA	697,681	767,723	859,428	953,196

Source: Ministry of Infrastructure and Energy (2018)

The scanning of economic and financial sustainability indicators (cost recovery; fee collection; transparency of billing) was based on the results of a preliminary survey conducted by the Municipality itself and an economic analysis of the service followed by a final monitoring of the Performance of Current Solid Waste Management Services.

The Municipality survey showed that up to 19 tons of solid urban waste is generated each day while during the summer months the waste generation in Saranda increases to 65 tons per day.

A private contractor is responsible for providing sanitation services to the Municipality pertinent to the collection of garbage at disposal sites. The table below depicts data provided

by the Ministry of Infrastructure and Energy in relation to the Municipality's annual waste management.

Table 3: Municipal annual waste

Municipality of Saranda	
Annual amount of urban waste (tons)	9,462
Annual amount of inert waste (tons)	2,000
Amount deposited (landfill)	9,412.31
Annual waste collection tax per household (ALL)	2,880
Annual budget allocated to waste collection and management (ALL)	61,000,000

Source: Ministry of Infrastructure and Energy (2018)

The available solid waste collection, disposal and transportation service is paired with surface cleaning and disinfection. The overall amount of containers and their estimated capacity does not cover the high rate of urban waste generation.

As of 2015, waste is disposed of at Bajkaj Landfill, a common 12 ha waste disposal spot for three adjacent municipalities of Sarandë, Delvinë and Himarë. It has a daily processing capacity of 140 tons of waste, and an estimated disposal capacity of 365,000 m³, for a processing period of 25 years. Waste cost per ton at the landfill has been estimated at \$14. However, despite the operationalization of the Bajkaj landfill in 2015, the disposal of waste at unauthorized spaces continues unabated to this day, and is mostly performed by private businesses, especially construction firms/units.

Moreover, there is no recycling strategy in place for the Municipality of Sarandë. Recycling in the Municipality is at an early phase, and is conducted primarily for economic purposes by members of the Roma community and street children, whose income is largely dependent upon waste collection.

In addition, there is no plant for the composting of biodegradable waste, and neither for the incineration of urban waste. The Municipality of Sarandë pledged in 2017 to dispose of at least 45% of the waste collected at the landfill, and to start a targeted recycling campaign that would have enabled 35% of the waste to be collected at differentiated collection points. However, it appears these targets have not been achieved yet.

The economic and financial analysis of the budget of the Municipality of Saranda was carried out primarily with the aim of identifying local funding sources (Saranda Municipality Budget) for the cleaning service activity.

The information and data provided does not carry the genuine stamp of the institution. It is rather based on various information sources outside the municipality or even through public portals.

As evidenced in the table below, the General Public Services program accounts for a significant share of the municipality's budget, with 22.25% of its total, compared to the specific share of the National General Services program (at www.financevendore.al), which for 2017 is at 5.48%.

Table 4: Structure of the Municipality's Total Budgetary Programs (MTBP)

<i>No</i>	Program Title	2017 Budget; ALL
.		
1	Administrative	347,462,000
2	Tourism Program	1,500,000
3	Sanitation & Waste	45,000,000
4	Landfill	16,000,000
5	Culture & Sports	23,489,000
6	Butrint	13,000,000
7	Education	30,741,000
8	Public Services	88,270,000
9	Social Institutions	3,085,000
10	Contracted Services	86,670,000
11	Budget Investments	30,421,000
12	Social Assistance	206,000,000
13	Total	1,464,638

Source: Municipality of Saranda (2018)

In the Budget Report 2017 of the Municipality of Saranda, it is noted that this spending program includes some of the functions of the municipality that contain the most vital community

services. Analyzing the level of performance of waste collection and cleaning referring to the data on the performance of the 2017 budget, only 66% of the value of the contract for 2017 was implemented while the costs of paying the Landfill fee are 90% of the planning. From the analysis of the services of the cleaning contract 2017 various obstacles were identified including:

- Different and unclear service areas;
- Lack of map of the areas and in particular of the placement of roads, sidewalks, squares, neighborhoods with relevant legends where the service will be performed and the frequency of delivery.

Lack of methodology and sanctions in case of non-performance.

The service provided by the company is largely labor-intensive, which is almost impossible to measure in relation to database, such as square area, street length, area and street area where night / day service is provided by simple vacuum cleaners or technological tools, etc.

In general, for the cleaning service and landfill, the contract values are planned in the Municipality budget and are fully covered only from the public utility tariff (waste cleaning, waste disposal, greenery and public lighting). However, in the 2017 Budget Report, it is reported that the value increased compared to the 2016 plan as a result of defying the taxable base.

From the analysis of the income and sanitation expenditure, the local revenue of the Municipality is approved in the Fiscal Package, which sets out the level of local taxes and fees, types, tax base, categorizations and sub-categorizations, payment installments, timing of their completion, mitigating conditions and chargeable structures of the Municipality of Saranda for collection. Based on Article 35 of Law no. 9632, dated 30.10.2006 "On the Local Tax System" as amended, and Article 14 of Law 68/2017 "On Local Self-Government Finances", Local Government Units have the right to set tariffs for a service that these units provide.

In support to the above-mentioned laws, the Municipality also approves the "Cleaning Fee", which stipulates that all households, domestic or foreign, natural or legal entities, residing and exercising economic activity within the territory of the Municipality of Saranda should pay to the municipality. The transparency of revenue data is also very low and although on the official website of the Municipality of Saranda www.saranda.gov.al the transparency program identifies the information and documentation available to the public, the fiscal 2018 package already on this page does not reflect the level of tax and tariff revenue generation (including service charge) for 2017 nor for the following year 2018. This data for the 2015-2017 period was yielded from www.financatvendore.al.

For 2018, the Municipality of Saranda has approved the Cleaning Tariff, which is presented in the 2018 Fiscal Package. The planning of the level of realization of local revenues analytically, according to each source, is not presented in any document on the Municipality website.

According to www.financatvendore.al the latest data on the reporting of the level of realization of local revenues, and the tariff of public services for the first half of 2018 in the Municipality of Saranda, are presented at a higher level than the same period of the previous year.

- a) Local tax and fee income on 6-M-I-2018 with a value of ALL 1,529 thousand more than in the same period 6-M-I-2017;
- b) Revenue from the tariff of local public services (waste, greenery) on 6-MI-2018 with a value of ALL 5,499 thousand more than in the same period 6-MI-2017, thus increasing the percentage of tariffs on services total revenues nearly 29% or 4.7% higher than the level of the previous year.

From the information received from the Municipality of Saranda, we have not been given the level of local revenue realization for the 2018 training period, and it is impossible to conduct an analysis on the cost recovery of the cleaning services from the revenue from the Public Utilities Tariff.

Only by referring to the data from www.financatvendore.al which shows that the level of realization of the tariff of local public services (waste, greenery) for 2017 was 68,364 thousand, we can say that:

- a) Compared to the 2017 Budget data, (where the level of service fee revenue planning is ALL 76,000 thousand) for the Waste Disposal & Treatment Program 45,000 ALL and Expenditure 16,000 ALL, totaling ALL 61,000 thousand, revenues from this fee cover 100% of the cost of services,
- b) This coefficient of coverage of 100% of the cost of cleaning services by revenue could be considered accurate if the data were from the Municipality of Saranda, which could make transparent the type of revenue grouped in the service tariff. public (cleaning, greening, lighting, etc.).
- c) From the available data and from the survey data, the coefficient of cleaning service per inhabitant across Saranda Municipality is 1,468 ALL / inhabitants.

Monitoring of the Performance of the Current Solid Waste Management Services was conducted throughout a period of 5 months, identifying the work done by the contractor, according to the items set out in the service contract, or even deficiencies arising during the cleaning process.

From these 21 items including collection and disposal of waste, transportation to landfill; cleaning and maintenance of containers; vacuum cleaners and special road vehicles; wet and wash them; removal of solid waste to designated landfill as well as clearing markets (vegetable

and bulk fruit); disinfecting the market, manholes and public areas, etc., the following were selected to be monitored:

- Waste collection and disposal;
- Container cleaning and maintenance;
- Cleaning of roads, squares and sidewalks;
- Road wetlands, squares and sidewalks;
- Environmental Education Program.

The biggest problems in terms of service performance were observed in Ksamil area, when the capacity of firms to provide the area with good, waste-free and clean service during high season appeared insufficient.

Below is the situation on waste management service performance indicators for the first half of 2018 according to the set of performance indicators.

“Waste collection efficiency” otherwise the amount of waste collected by the body authorized for this service against the total amount of waste generated in LGUs for both urban and rural areas. The reliance on this indicator depends heavily on the methods used to collect the data. The municipality with the construction and operation of the Bajkaj landfill has accurate data regarding the amount of waste collected and deposited in the landfill we can say that the reliability of this data is high. However, from the data collected the coverage rate of waste collection for urban area is 100% and for rural area is 100%.

"Cleanliness of the city" expresses the effectiveness of waste collection and street sweeping. It is evaluated in three aspects: the effectiveness of waste collection, street cleaning and rural areas. Regarding the presence of waste around the containers we can say that in the urban area there is a moderate presence of waste, while in the street there is a low presence of waste. In rural areas there is moderate waste presence and number of hot spots created. This indicator is classified in the middle category (65%) with medium accuracy, as part of the data comes from the survey conducted during May 2018.

The "Public Perception" questionnaire was conducted with 400 residents and 100 businesses in the area. Asked about the quality of cleaning in the neighborhood / village / city where 76% live, they answered that their environment is clean.

“Reuse: the rate of differentiated waste collection in urban areas” represents the extent of waste officially collected from a closed cycle since collection points to a further treatment center. There is no official data, but according to the discussions with municipal specialists differentiated waste compared to the total waste collected does not exceed 5%.

"Transparency of the billing system" Evaluates the capacity of the municipality to issue a bill to the customer. Currently the public works (cleaning / greening / lighting) tariff is sent to the citizens through the Drinking Water Invoice also for the cleaning service, but they are not familiar with the tax details and local fees because this value is not presented analytically on the invoice. Only when citizens head to the municipal counters to get a service are they informed of local taxes and fees. Therefore, it can be said that transparency is low and should be addressed by mailing each family at least once a year, together with a fact sheet about the quality of service provided, and elements of service transparency. There are such examples in some municipalities in the country.

"Protection of natural resources: extent of waste treated in sanitary landfill or approved landfill". The waste collected during these years (100%) has been sent to the sanitary landfill of the Municipality where they are further treated. Also the degree of veracity over the amount of waste deposited there is high, as there are official records and scales in the landfill.

"Tariff Cost Coverage" Compares the total cost of service and its financing through the tariff set and the level of its collection. For the cleaning service and the landfill, 44,942 thousand ALL contracts and 16,000 thousand ALL landfill costs are planned in the Municipality budget, the total value is 61,000 thousand ALL, which are covered 100% only by the public utility tariff (cleaning, waste disposal, greenery and public lighting)

"Citizens' Contribution to Service Financing: The Level of Tariff Collection" reflects the capacity / desire of the population to pay the fee. The annual revenue generated from the clearance fee for 2017 is ALL 68,364 thousand, while the total planned revenue of ALL 76,000 thousand has generated 90% of the planned revenues.

SWOT analysis of organizational structure of the Municipality of Sarandë

This SWOT Analysis was produced after the administration of a questionnaire to administrative staff employed at the Municipality of Sarandë, in the relevant sector – the Directorate of Public Services. The main purpose was to assess the state of existing MSW management systems and structures in the Municipality of Sarandë. The results are outlined below.

STRENGTHS

Encouraging recycling practices and their promotion for the general public;

Gradual reduction of MSW's cost per ton;

Implementation of appropriate waste management techniques and technology for the reduction of biowaste generation;

Enhancing and/or increasing the capacity of the municipality to set green collection points for the improvement of waste differentiation;

Enhancing the capacities of composting facilities in sorting biowaste.

WEAKNESSES

Outdated equipment;

Problems with permanent staff remuneration, as well as reduced numbers of permanent staff;

Problems with coordination at the local level, lack of adequate managerial roles/responsibilities and a poor implementation framework;

Low awareness/education of local residents and tourists on the necessity of sorting/differentiating waste at the collection point unit;

Damaged equipment;

Inefficient waste collection by municipal workers;

Lack of investments/financial sources for the acquisition of new equipment;

No significant investments in upgrading existing technology at the local, as well as central level;

The two-decades long construction boom which has led to an increased accumulation of MSW;

Low levels of public accountability and a weak regulatory framework;

High concentration of informal MSW disposal points.

OPPORTUNITIES

Performing a comprehensive upgrade of the existing infrastructure, logistics and technology at all levels – from the collection point to the composting units;

Conducting a thorough study on the feasibility of waste management and the system's upgrade;

Exploring the option of developing alternative methods of waste management;

Purchasing equipment and vehicles through financial tools enabled by the participation in European programs;

Implementing programs aimed at increasing waste management expertise.

THREATS

Budget cuts and reduced sources of funding for financing the development of relevant infrastructure;

Technical complexity associated with the management/treatment of specific types of waste;

Insufficient and/or inadequate waste management equipment and infrastructure – not aligned with stated goals;

Geographic and/or geophysical challenges associated with terrain and waste properties, including the diverse dispersion of settlements, their altitude and infrastructure.

Conclusions

Below are listed some of the most important conclusions drawn from the above analysis:

- The cleaning service information is non-existent. It does not reflect the budget of the year 2018.
- It is not a separate service, but merged with that of the Maintenance Company.
- Solid waste management is conducted through a third-party contact.
- All areas are covered with waste management and sanitation services, except for the newly-populated neighborhoods.
- Tax and fee levels are not reflected on the official website. Only construction/water sanitation services are published in the information bulletin boards of the Municipality.
- To date, there are no political/strategic documents.
- To date, no waste recycling practices have been put in place.
- Waste collection and management at the peak of the season is ineffective. The monitoring system is weak and fines are not operational.
- Suburban areas have problems with infrastructure as containers are missing.

(vi) Recommendations

Recommendations pertaining to the above, include:

- Increasing transparency and accountability by publishing information, as it represents legal obligation.
- The cleaning service should be separated from other services within the programs, according to the DCM 319, dated 31.05.2018.
- Contracts must be reformatted according to new waste management conditions, criteria and standards.
- The service should cover 100% of the Municipality's area.
- Taxes and fees should be made available to the public.
- A Local Plan for the Management of Solid Waste should be devised/updated as soon as possible.
- Source separation of waste and piloting of composting in the markets should begin at the retailer level.
- Modernize the service and divide the territory into service areas that can be contracted separately specially to respond to the tourist flow. The wiping and cleaning service can also be provided by the municipality itself. Enclose the construction pits as they can turn into illegal dumping spaces.
- Containers should be added especially nearby supermarkets and areas where high levels of urbanization are concentrated. Small bins on the promenade should be added, as well.

Municipality of Sarandë should design local plans in accordance with national waste strategy and

master plan as well as regional plans to increase effectiveness and optimize service cost;

Improve overall waste management performance - starting with timely documentation, collection

and reporting of indicators, but also with the extension and optimization of the service whether public or private. In the latter case, it is important to draft and enforce strong contracts with clear volume specifications, measurable and monitored in real time and spread over the territory.

Improve waste management accountability - municipalities need to make greater efforts to raise public awareness, businesses and politicians, to enable action to be taken and resources to be programmed.

Avoid collection on a fixed schedule to increase inherent inefficiency in the collection of garbage and monitoring of the operations through the introduction of IoT. The evidence for it is the presence of so many overflowing waste containers, especially at high tourist sessions that increase both the environmental risk and the potential Health and Safety incidents.

- Supply activities of common solid waste bins (over ground), electric and/or hybrid-electric technology garbage trucks.
- Underground infrastructures of solid waste bins
- Mount of ultrasonic sensors to Waste Bins to measure the fill-level of the waste bins (devices use GSM technology to send short messages to communicate with the centralized gateway, which uploads the received data to the cloud-based data analytic engine)
- Pilot project of scanning the Bins' content for detection of recyclables' composition.
- Cloud based application/platform to forecast and plan the waste collection schedules and routes and generate reports.
- GIS Platform of garbage truck routes (mobile compatible)
- Conduct Information campaigns to schools and other stakeholders.

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Attitude and willingness to pay for circular fashion, Comparison between Albania and Kosovo

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Abstract

Today, with the world is facing major environmental problems, the places where we live in are becoming less safe, and the causes of these changes are, partially due to human behavior. In order to raise consumer awareness on production and consumption of environment-friendly products, we must first know their purchasing attitudes and willingness to pay.

This study aims to assess and compare if and to what extend consumers in Albania and Kosovo are willing to contribute to sustainable consumption behavior by focusing on clothing goods consumption. The conducted survey highlighted substantial differences between the two countries, namely differences in the importance of circular economy features, availability of eco-labels and increasing adoption of sustainable production processes. However, in both countries the same level of importance was registered when asking the recipients how important reducing air pollution stemming from production lines was for them. The survey also inquired regarding costumer's inclination to pay for sustainable products. Kosovar consumers were more prone to sustain increased prices for sustainable products than their Albanian peers. Nevertheless, when recipients were given data and certified information regarding the environmental impact that certain fashion items have, both countries registered higher level of willingness to pay for circular products.

The study shows that given detailed and verifiable information regarding good's environmental impact, Kosovar consumers are willing to pay more for sustainable goods than the Albanian consumers.

In this paper, the theoretical and practical implications of the study are discussed, emphasizing the role of awareness between purchases and environmental protection.

Keywords: Circular economy, Willingness to pay, Attitude, Fashion industry, Environmental Information.

Jel Code: O44, Q01, Q56

Introduction

Today, the tendency to move from the linear economy to the circular economy seems to be a global trend. Policies and strategies at global, regional, and national level are being adopted to ensure actors a fast and effective transition towards circular economies. However, these plans and strategies vary substantially from one country to another.

In March 2020, the European Commission adopted the Circular Economy Action Plan (CEAP) [1]. This EU action plan is one of the main pillars of the European Agenda for sustainable growth: the European Green Deal. This plan is thought to ensure both economic sustainability and economic growth to European countries as well as to those that like some Western Balkan countries aspire to be part of it in the future. This circular economy action plan also includes sectors, where one of the sectors is textile and clothing, a sector that is part of this study.

The shift from the linear economy to the circular economy for all industries included in the transition and not only for the clothing industry, would bring benefits. The circular economy itself aims to separate global economic development from the consumption of limited resources [2]. This economic model creates the possibility of generating profit without generating a harmful environmental impact. [3]

The textile and clothing industry is a very large industry not only in terms of the income generated but also of the world consumption that it has. This industry has in recent years massively adopted for the fast-fashion approach: cheaper and quickly replaceable products, with a short life cycle, at steadily low prices; a massification of the clothing production processes that feeds onto the consumer's behavior of regularly discarding old products for new ones. An approach that has significantly harmed the environment and that will continue to do so in the medium-to-long term. The shift from the linear to the circular model requires knowledge, awareness, and engagement of all market participants: manufacturers, technology and product designers, and consumers [4]. In fact, prior to implementing circular economies initiatives, it is important to analyze and understand the demand side and people's willingness to purchase CE products, making consumers a fundamental actor of change. Lack of inclination of consumers to purchase CE products therefore represents a key barrier to implementing CE initiatives [5]. This seems to be reiterated by the research conducted by Koszewska et al 2021, that suggest that the speed and success of change depends directly on consumers. Many studies carried out in the field of circular economy are based on business models (3,6,7), supply chain [8] or product design and materials [9]. However, increasing literature is also being produced focusing on the role of consumer attitudes and behavior towards CE. This literature seems to emphasize on several ways in which consumer awareness can be increased, such as improving information and communication [6], improving the perceived value of sustainable goods [10], emphasizing environmental importance of opting for sustainable goods [11], and increasing concern [12].

Despite the abundance of literature produced in recent years, there is still limited research conducted in the Western Balkan region. This paper wants to address this gap in literature by proposing a comparative analysis of two Western Balkan countries, Albania, and Kosovo, in regard to the attitude and inclination of consumers to pay for sustainable and circular products.

The article is structured as follows: this first section served as an introductory assessment of the issue and topic of the research. The second section will provide an overview of the adopted literature supporting hypothesis development. The following section will then provide an array of data, methods and procedures used to produce this research, followed by the analysis and discussion of the results. The fifth and final section will present conclusion, limitations and propose further areas of research.

Literature Review.

The transition from the linear economy to the circular economy requires the involvement of all actors of the ecosystem. Consumers are one of the most important actors for the realization of the transition. Consumers, as the most human factor of the ecosystem, are guided by their attitudes towards all objects. Although formal definitions of attitude theory vary among different authors, most theorists today agree that attitude is the tendency to respond to an object with a favorable or unfavorable degree. [13]. This evaluative response is generally thought to be based on the person's expectations or beliefs about the attitude object. This expectation is explained in the expectation-value model of Fishbein 1967 and further expanded by the authors in the model of Fishbein & Ajzen, 1975 [13-14]. According to this model, a person's general attitude towards an object, such as a product, is determined by the subjective values or evaluations of the attributes associated with the product and by the strength of these associations.

Considering this theory of expectation, the transition from a linear economy to a circular one, should increase the expected value of objects in such a way that consumers respond to it at a favorable degree.

However, there are several elements that can lead consumers to negatively respond to circular products.

An example would be the consumer's lack of familiarity with the circular products [7]. Nevertheless, even in these cases, studies show that in regards to the fashion industry, the willingness of consumers to consume circular goods is still high vis-à-vis the low familiarity with the circular products. This seems to be especially true for younger generations [15]. The notion of circular economy is a recent concept, and much less known in the countries studied by this research. Existing literature identifies other factors as well that can influence consumers attitudes towards circular economy. Rousseau & Carmen (2021) mention factors such as: a) financial aspects – price can be a major driver-, b) easy to use and product-service quality, c) status-symbol, d) desire and image – they argue that decisions can be influenced by the desired perception and lifestyle that the consumer wants to portray and e) risk perception [7].

The literature has identified a multitude of solutions to increase the positive attitude of consumers towards circular products. Some studies emphasize the importance of increasing consumer knowledge about the economic benefits that come from the principles of the circular economy [5]. Other authors emphasize the importance of sustainability and health-related information to consumers and the importance of product labels in general [10]. Studies also argue that the choice is further influenced by the degree to which the consumers believe to have control over the events in their lives, in other words if they believe that their actions will

positively impact events towards the desired outcome. This is called consumer locus of control or perceived control [16].

Despite the extent of studies and research that focuses on information and motivation behind the consumer consumption of circular and sustainable products, lighter needs to be shed on demographic and cultural factors, as they play an important role in influencing the perception of the products and ultimately in the adoption of circular processes and solution [17].

In this study, we focus on the differences in consumer attitudes in two Western Balkan countries. Albania and Kosovo are both in the first legal steps of the transition from the linear economy to the green economy. However, although referring to the legal steps in Kosovo, the concept of circular economy has not yet been adapted into law. Albania and Kosovo have taken some sporadic steps towards the circular economy, where it is mostly the initiative of the companies of these countries than a functional ecosystem [18].

This study focuses on analyzing the differences in consumer attitudes in two Western Balkan countries: Albania and Kosovo. Both countries are in their first stages of adopting circular solutions for a green economy. However, despite some legal aspects, the transition has not translated into operative laws. In fact, both governments have taken sporadic steps towards enabling the transition that is therefore left to the will of the private entities [18].

Although the objectives of the Albanian and Kosovar government of transitioning towards circular economies are the same, the context in each country is not. Influences by history, culture, social relations and economic trends, consumer's attitudes are different. This study will analyze the differences in consumer attitude towards circular products. The aspects included in the analysis are: design of sustainable products, sense of empowerment of consumers through label products, and circular in production processes.

Based on these aspects, this study will test the following hypothesis:

H1: There are significant differences between Albanian and Kosovo consumer attitudes toward circular cues for fashion products.

H2: There are significant differences between Albanian and Kosovo consumer attitudes toward eco-labels for fashion products.

H3: There are significant differences between Albanian and Kosovo consumer attitudes toward circularity in production processes in the fashion industry.

To test whether the attitude of consumers is related to their decisions and actions, the study will also be measuring consumer's level of willingness to pay for circular fashion products. The Willingness to Pay (WTP) is a direct measure of consumers' real valuation of the product for his utility [19]. Willingness to pay is basically the maximum value that a buyer pays for a product or service. WTP is generally influenced the type of product, and on the demographic characteristics of the consumer [20-21].

The WTP is expected to decrease based on price, functionality and quality perceived for these fashion products made with recyclable or sustainable materials [5]. To increase WTP, the literature suggests several influencing factors. WTP can be increased by providing information

on the positive impact that the product has on the environment [20], by emphasizing social and personal benefits [6] as well as informing costumers about their own benefits stemming from higher quality and healthier products [22]. In addition to these, other external factors such as fiscal incentives (tax incentives) that can increase the WTP [22]. Furthermore, literature shows that one other prominent factor that can push consumers towards consuming used products, the so called “second-hand fashion” is the lower price that these items tend to have on the market [17,21]. Although the biggest driver of willingness to buy these fashion products is price, this study has chosen to test the WTP based on the environment and emission- related information provided to the consumers. The literature suggests that this information when certified by third parties increases people’s WTP [23]. Based on this, the study has designed three scenarios in order to observe three WTP in the two selected countries: a) one scenario in which this information is not provided; b) one scenario in which the information is in fact provided; and c) one third scenario in which the information provided is certified by third parties. Based on these scenarios, this study will test the following hypothesis:

H1: Consumers’ WTP for a product that is made from recycled materials is less than their WTP for products that are made with virgin materials.

H2: When consumers are provided information about the environmental benefits of a product made with recycled materials, they are willing to pay more for it than the same product that lacks environmental information.

H3: When consumers are provided information about the environmental benefits of a product made with recycled materials, and this information is verified by an independent third-party, they are willing to pay more for it than the same product that lacks third-party certification.

Data and methods

To assess and compare consumer attitudes towards selected aspects of CE in the fashion industry between the two countries, an online and on site survey was used in Albania and Kosovo. The data was collected by the managers of two clothing stores located in two shopping centers, respectively in Tirana and Pristina. From the collected dataset two questionnaires were excluded from the collected data as the respondents did not belong to one of the two countries included in the study. The dataset consists of 76 questionnaires completed in Albania and 53 questionnaires completed in Kosovo.

To measure attitudes towards circular labels for fashion products, ecological clothing labels and circulation in production processes this study has adopted the questions provided by Koszewska et al (2020) study [4]. The socio-demographic characteristics of the respondents can be found in Table 1. The respondents were asked to rate the relative significance of each circular cue based on a 5-point Likert type scale (from 1 = strongly disagree/ unimportant to 5 = strongly agree/very important). Cronbach’s alpha scores reached an acceptable level of reliability ranging from 0.783 to 0.853 (Table 2). Cronbach α was computed to test reliability to ensure the quality of the measurement.

To test the WTP, the questions of a study by Pretner et al (2021) were adopted [24]. Here, they were asked through three scenarios (without information, with information, and with certified

information), regarding the amount of money that they were willing to pay for a hoodie made of non-virgin materials.

Table 1 :Socio-demographic characteristics of the respondents

	Albania	Kosovo
Gender		
Male	25%	25%
Female	73.7%	73.7%
Other	1.3%	1.3%
Age		
18-24	15.8%	13.2%
25-34	47.4%	32.1%
35-44	32.9%	30.2%
45-54	3.9%	11.3%
<55	0%	13.2%
Education		
Low	1.3%	1.9%
Secondary	9.2%	20.8%
High	82.9%	64.2%
Professional	6.6%	13.1%
Monthly income		
Minimum	10.5%	17%
Average	71.1%	41.5%
Above Average	14.5%	35.8%
High	3.9%	5.7%
No. of respondents	76	53

Table 2: Questionnaire items and measurement instrument for attitude toward CE

Category/construc	Answer categories	Scale	Cronbach's alpha	Leads from the sustainable product policy framework
Circular cues for fashion products	Importance of the following factors for purchasing decision for clothing: Q1: Garment Life (possibility to repair/reuse/dispose) Q2: Recycling (possibility to recycle) Q3: Durability Q4: Certified eco-friendly label	5-point Likert-type scale	0.783	Sustainable product design: selected aspects: - improving product durability, reusability, upgradability, and reparability - increasing recycled content in products - enabling remanufacturing and high quality recycling
Eco-labels for fashion products	Q1: I believe that environmental information on the product label is important Q2: I generally believe in the environmental information on the product label	5-point Likert-type scale	0.807	Empowering consumers: - setting minimum requirements for sustainability labels/logos - proposing that companies substantiate their environmental claims using Product and Organization Environmental

Q3: I believe environmental certification can be helpful for buyers

Footprint methods and integrate them into the EU Ecolabel.

Q4: I believe that there is a need for environmental certification of fashion related products

- include more systematically durability, recyclability, and recycled content in the EU Ecolabel criteria

Q5: I understand the concept of environmental certification

Circularity in production processes

Q1: I believe that environmental information on the product label is important

5- 0.853

Circularity in production processes:

Q2: I generally believe in the environmental information on the product label

point Likert-type

promoting circularity in industrial processes in the context of the review of the Industrial Emissions Directive

Q3: I believe environmental certification can be helpful for buyers

scale

Q4: I believe that there is a need for environmental certification of fashion related products

Q5: I understand the concept of environmental certification

To identify if there are statistically significant differences in consumer attitudes, the Mann–Whitney U test, a nonparametric test, was used. Regarding willingness to pay, independent-sample t-tests were conducted to compare the WTP means in all the three conditions with respect to the reference price. To test the hypothesis H2 and H3 in WTP a one-way between subjects ANOVA was conducted to compare the effect on WTP of the two treatments.

Results and discussion

In the case of circular cues for fashion products, the Mann–Whitney U test showed that overall, there are significant differences between the two countries. The results shows that the aspects such as garment reparability, reusability, or a lack thereof (disposability), recyclability, and environmental performance certified with an ecolabel are high importance for consumers in Kosovo. Furthermore, this model also highlighted how the most substantial differences were evident in regard to “Circular insurance for fashion products, where the Null Hypothesis is rejected in all the scenarios, corroborating H1.

On the other hand, differences are less significant when observing consumer’s attitude towards sustainable labels.

When asking Q4 under “Circularity of Fashion Products”, both countries scored high, without any substantial difference between the two constituencies. However, significant differences where registered in all other statements.

The results of this research show that Kosovar consumers are more inclined to support the notion that certified data regarding sustainable labels is useful for buyers, as well as have expressed stronger convictions regarding awareness and understanding of the impacts that fashion goods have on the environment. Furthermore, Kosovar consumers are more inclined than Albanians to believe that such data made available to consumers is important. Based on the results shown, H2 was corroborated showing statistically significant differences between the two countries.

Table 3. Differences in consumers’ attitudes toward a circular fashion— Mann-Whitney U Test

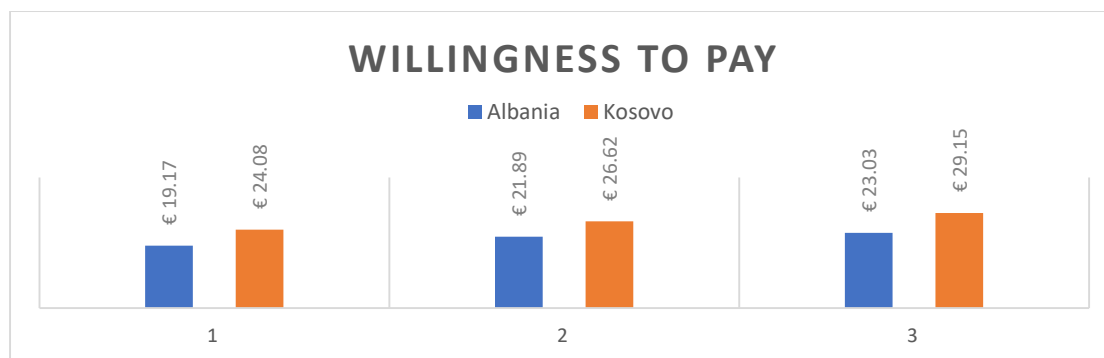
	Consumer attitudes -questionnaire items	Country	N	M	SD	Mean rank	Mann-Whitney U test	Asymptotic statistical significance p	Decision
Circular cues for fashion products	Garment life (repairability/reusability/disposability)	Albania	76	3.70	0.86	59.09	2463.500	.021 *	Reject the null hypothesis.
		Kosovo	53	4.04	0.85	73.48			
	Recycling (recyclability)	Albania	76	3.47	0.90	56.35	2671.500	<.001 *	Reject the null hypothesis.
		Kosovo	53	4.00	0.75	77.41			
	Durability	Albania	76	3.41	0.88	57.87	2556.000	.005 *	Reject the null hypothesis.
		Kosovo	53	3.79	1.06	75.23			
	Certified eco-friendly label	Albania	76	3.58	0.12	58.39	2516.000	.010 *	Reject the null hypothesis.
		Kosovo	53	4.02	0.95	74.47			
I believe that environmental information on the product label is important	I believe that environmental information on the product label is important	Albania	76	3.36	1.10	57.86	2557.000	.006 *	Reject the null hypothesis.
		Kosovo	53	3.89	0.93	75.25			
	I generally believe the environmental information on the product label	Albania	76	3.57	0.99	56.99	2622.500	.002 *	Reject the null hypothesis.
		Kosovo	53	4.06	0.98	76.48			
	I believe environmental certification can be helpful for buyers	Albania	76	3.80	0.81	59.13	2460.000	.023 *	Reject the null hypothesis.
		Kosovo	53	4.11	0.86	73.42			

	I believe that there is a need for environmental certification of fashion related products	Albania	76	4.07	0.77	62.36	2215.000	.286	Retain the null hypothesis.
		Kosovo	53	4.23	0.66	68.79			
	I understand the concept of environmental certification	Albania	76	4.00	0.81	59.76	2412.500	.038 *	Reject the null hypothesis.
		Kosovo	53	4.30	0.69	72.52			
Circularity in production	Reduced water use in production processes	Albania	76	4.07	0.86	58.88	2479.000	.015 *	Reject the null hypothesis.
		Kosovo	53	4.34	0.99	73.77			
in	Impact of production processes on air quality	Albania	76	4.20	1.00	60.61	2347.500	.076	Retain the null hypothesis.
		Kosovo	53	4.53	0.66	71.29			
processes	Reduced energy use in production processes	Albania	76	4.16	0.96	59.67	2419.000	.033 *	Reject the null hypothesis.
		Kosovo	53	4.53	0.66	72.64			

The last aspects analyzed was the consumer’s consumer attitudes toward circular production processes. As we can see, statistically significant differences were not occurred only for the impact of fashion production processes on air pollution. In this case both countries show the same importance. For two other aspects we find statistical differences between two countries. When analyzing the answers relating to whether consumers perceive a need in the reduction of water and energy reduction in production processes, Kosovo scores higher than Albania. Based on these results we can conclude that H3 was only partially supported, as statistically significant differences were noted for two out of three statements.

Another approach has been used to identify the WPT. For the purpose of this study, three scenarios have been built. In the first scenario the consumer is provided with the value of a hoodie made from virgin materials and asked how much they would be willing to pay for the same item from recycle material, however, in this scenario there is no mention of the environmental impact of either of the items. Lower levels of WTP were expected in this scenario (Scenario 1). In this case, we raised the Hypothesis of the lowest willingness of consumers to pay for fashion products made with recycled materials. Independent-sample t-tests were conducted to compare the WTP means in all the three conditions with respect to the reference price (20 euro). Only in the first scenario, the willingness of Albanian consumers to pay for hoodies made from recycled materials was lower than for those made from virgin materials. This result shows that the first Hypothesis is partially accepted, only for Albanian consumers and not for Kosovar ones. The results obtained for all three scenarios are presented in Figure 1.

Fig.1 Willingness to Pay for a recycle Hoodie



In order to test H2 and H3 one-way between subjects ANOVA was conducted to compare the effect on WTP of the two treatments. The results show a significant effect of the information provided on WTP at the $p < 0.05$ level for the three conditions for Kosovo consumers [$F(3, 059) = 5.39, p = 0.005429$], and not for Albanian consumer [$F(1, 469) = 3.03, p = 0.232291$].

In this case, we will accept hypothesis 2 of the increase in consumers' willingness to pay when they receive environmental information, and Hypothesis 3, when this information is certified by third parties only for Kosovar consumers. On the contrary, for the Albanian case, HP2 and HP3 are to be rejected.

Conclusions, Limitations, and Future research

In terms of circular cues for fashion products, the study indicated that there are significant differences between Albania and Kosovo. The results shows that the aspects such as garment reparability, reusability, or a lack thereof (disposability), recyclability, and environmental performance certified with an ecolabel are high importance for consumers in Kosovo. This suggests that in addition to the differences between the two countries, there is also an important difference such as the variability of purchase criteria. For Kosovar consumers, the importance of purchasing is not only related to economic benefits, but also to circular cues. Statistically significant differences between the countries emerged in the case of the attitudes toward the second analyzed aspect: environmental labels for fashion products. The Albanian consumer had less confidence and trust in environmental information, and less recognition of environmental certification, although, like Kosovar consumers, they understand the need for environmental certification of products. All operators in the fashion market and state structures should work harder in the Albanian market to focus their efforts on building trust and faith in environmental information labels for fashion product. Regarding the selection of clothes that are less harmful to the environment, Kosovar consumers are more willing to choose them in relation to the environmental benefits that their production process brings. In this case, the differences between the two countries are less evident, since we did not notice any differences between the countries for the environmental benefits of air quality. Even in this case, Albanian consumers should be made aware of the benefit to further increase their positive attitude towards it.

The results of this study showed significant differences in attitudes towards selected aspects of circular fashion in Albania and Kosovo. This information should enable multinational fashion manufacturers and retailers to better understand the behavior of fashion buyers in the context

of CE, as well as work in specific contexts to increase trust and belief in the benefits of circular fashion products.

Referring to WTP, the study suggests that circular clothing is valued less than conventional clothing by Albanian consumers when no environmental information is provided, and more by Kosovar ones. In fact, the WTP for the circular option is always higher than the WTP for a hoodie made entirely of virgin material.

The findings of the study show that providing environmental information increases consumers' WTP for a green product and confirmed the important role played by third-party verification of information provided only to Kosovar consumers. The importance of the effect of increasing WTP is not significant.

The study has some limitations. First, it was based on a small sample, making the findings unlikely to represent the populations of two countries. Second, the study was channeled only in one product therefore, the findings may not be valid for other consumer product groups. Third, to measure WTP, only one element of the circular mode was used, such as the recycled material, removing the possibility of comparison with other elements. This study was limited to the comparison of the attitude and WTP for circular fashion products in only two countries, Albania and Kosovo, but the considerations of further research may be in other countries and the data collected should be larger to better represent the population.

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‘CIRCULAR ECONOMY’ – the new approach in many countries; general overview of the latest developments based on international standards - potential application to Albanian context.

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Paper context

In our everyday life, we take materials from the Earth, make products out of them, and eventually throw them away as waste. The process is referred to as a linear one, contrary to the modern approach related to the concept of ‘circular economy’, which by contrast to linear process, the waste produced by the process needs to be stopped or recycled. In this context, circular economy offers business leaders and governments a clear opportunity for long-term growth that is less dependent on cheap materials and energy, and which can restore and regenerate natural capital.⁴⁵ It is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution.

The circular economy is a systems solution framework that contributes to the delivery of the United Nations’ Sustainable Development Goals (SDGs). The circular economy is underpinned by three principles, all driven by upstream design and innovation: eliminate waste and pollution, keep products and materials in use, and regenerate natural systems. Increasingly based on renewable energy and materials, and harnessing the power of digital technologies, the circular economy offers a resilient, distributed, diverse, and inclusive economic model. The circular economy is core to the delivery of SDG12 (to ensure sustainable consumption and production patterns) and delivers benefits across a further eleven SDGs including SDG9 (*to build resilient, inclusive and sustainable industrialisation, together with infrastructure and innovation*).⁴⁶

The concept of circular economy is based on three principles mainly related to:

elimination of waste and pollution

circulation of products and materials (at their highest value)

regeneration nature.

⁴⁵ For more detailed information please refer to ‘Toolkit for policy makers’ - Delivering the circular economy: a toolkit for policymakers (ellenmacarthurfoundation.org)

⁴⁶ For more detailed information please refer to International Resource Panel, Resource Efficiency: Potential and Economic Implications (2017).

Circular economy is supported by a transition to renewable energy and materials. A circular economy separates economic activity from the consumption of limited resources; it provides a good platform for business, people and the environment.

It is necessary that our society transforms every element of the ‘take-make-waste’ system, how we manage resources, how we make and use products, and what we do with the materials afterwards. Only then we can create a thriving circular economy that can benefit everyone within the limits of our planet. The circular economy brings health benefits through reduced environmental impacts, improved resource management, and advances in food safety and security. It has the potential to bring an average net employment gain.

Moving to a circular economy is essential for delivering Sustainable Development Goal (SDG) on responsible consumption and production. It can also deliver benefits across the industrial development, and *inter alia* climate action. It is also a new way to transform the entire system. One of the most important issues on our daily economy is the challenge of exploring what will it take to transform our throwaway economy into an economy where waste is eliminated, resources are circulated, and nature is regenerated. In this regard, the circular economy provides the tools to tackle climate change and biodiversity loss, while addressing important social needs, as well as the power to increase prosperity, jobs, and resilience that contribute towards cutting greenhouse gas emissions, waste, and pollution.

What are the main policies / goals related to circular economy?

The circular economy provides a framework which allows governments and cities to realise many of their economic, environmental, and societal ambitions. There are five universal policy goals, which provide a framework for national governments, cities and businesses to create a transition that fosters innovation and decouples growth from finite resource consumption and environmental degradation.

Policymakers have a unique opportunity to enable and accelerate the industrial transformations needed to scale the circular economy. The principles are being applied by an increasing number of the world’s largest businesses from across different sectors and value chains. Private sector investment in circular economy opportunities is also rising sharply with, for example, the assets under management in public equity funds dedicated to the circular economy having grown fourteen fold in 2020 alone. To further advance this trend, creating the conditions for circular solutions to emerge at scale is therefore crucial and policy can play a key role in this.⁴⁷

I. A. Benefits of a circular economy – FIVE GOALS

CE can regenerate natural systems and improve resilience, health and wellbeing. It can also help tackle global issues like climate change, pollution, biodiversity loss, etc. As governments and industries around the globe move towards the CE, it’s crucial to line up the goals and aspirations, as well as create a shared route.

⁴⁷ For more detailed information, please refer to Elle MacArthur Foundation - Universal circular economy policy goals: Enabling the transition to scale (2021), pg.

There are five goals, that provide a blueprint for co-operation and establish a need to work together across the private and public sectors in order to make these goals effective; these goals recognise that the relevant policies are interconnected, avoid the fragmented solutions, reduce friction across borders and ultimately lower the costs. The close co-operation also minimises the risk of individual policy measures remaining isolated in a wider, unchanged economic system that's based on a linear 'take-make-waste' approach.

CE Goal # 1. Stimulate design for the CE

Enable all products (from fast-moving consumer goods to long-term assets) to be designed, accessed, and used in ways that eliminate waste and pollution – this could be achieved by stimulating high-quality design for goods and packaging with an emphasis on durability, reusability, design for repair-ability and remanufacturing, recyclability and compost-ability; by sharing of information and tracking through product labels, tags, and digital product material passports and encouraging regenerative production through product and formulation design, sourcing practices, as well as agricultural and land-use policies.

CE Goal # 2. Manage resources to preserve values

This goal is mostly related to the promotion and the development of business models and resource management systems that keep products and materials in the economy at their highest possible value. It could be effectively achieved by implementing tax and procurement policies that foster repair, sharing, resale, and remanufacturing to maximise asset use and return on invested energy, by reviewing and harmonising resource classifications and definitions in waste legislation as well as by strengthening resource loops through Extended Producer Responsibility (EPR) policies and Deposit Return Schemes (DRS) to support circular opportunities from reuse to recycling.

CE Goal # 3. Make the economy work

It really important to create economic incentives and set regulatory requirements that enable circular economy solutions to become the norm rather than the exception, thereby unlocking benefits at scale. This can be achieved by aligning taxation and fee incentives, with circular economy outcomes, by reforming and, where relevant, deploying subsidies, as well as incorporating circular economy principles into trade policies.

CE Goal # 4. Invest in innovation, infrastructure and skills

In order to have an impact on the goals set and measures taken, it is of need to invest public money, and stimulate private sector investment to develop the skills required to create circular economy opportunities. This will ensure an inclusive transition, supporting innovation, and developing the infrastructure necessary to scale the transition by providing interdisciplinary research funds, supporting blended finance solutions for physical and digital infrastructure, and innovation and incorporating the circular economy in school and higher education programmes.

CE Goal # 5. Collaborate for system change

For achieving tangible results and having a better impact it is crucial to foster responsive public-private collaboration across value chains to remove barriers, develop new policies, and

align existing ones, as well as work across government departments, nationally and internationally to build policy alignment and durable change. In addition to these, measure progress towards embedding a circular economy approach across sectors.

These could be achieved by promoting the establishment and adoption of multi-stakeholder, cross-value-chain, inclusive and responsive working mechanisms to develop system solutions and to build public-private capacity, by mainstreaming circular economy principles into national and international policies, and building cross-border policy alignment and accelerating progress through measurement and use of data.

UN Resolution on Plastic Pollution 2022

UN Resolution on Plastic Pollution, is a legally binding global instrument to end plastic pollution, a historic decision and a major leap towards a plastic free ocean for all. It is trying to on-board governments to tackle plastic pollution in a way that the Paris Agreement has done for climate change and the Montreal Protocol⁴⁸ has done for ozone depletion. Indeed, for most other pressing environmental challenges that entail growing negative transboundary impacts and require problem drivers to be addressed internationally, there is already a global policy framework in place.

Plastic pollution is rapidly outpacing current efforts to stop it. Without additional measures, the volume of plastic on the market will double, the annual volume of plastic entering the ocean will triple, and ocean plastic stocks will quadruple within the next 20 years. The costs of inaction increase year-by-year, if we fail to work towards a global solution.⁴⁹ Addressing the plastic pollution crisis requires a concerted approach to create a circular economy for plastic, based on three main principles:

Eliminate all problematic and unnecessary plastic items we do not need

Innovate to ensure that the plastics we do need are reusable, recyclable, or compostable

Circulate all plastics items we use to keep them in the economy and out of the environment

⁴⁸ In the case of the Montreal Protocol for example, it took only 18 months to reach a binding global agreement to protect the earth's ozone layer, once there was a clear understanding of the problem and consensus between governments about the scope and timeframe for political action. As a result, the ozone hole in Antarctica is slowly recovering, and projections indicate that the ozone layer will return to 1980 levels between 2050 and 2070.

A more recent example is the so-called Minamata Convention to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. It has been signed in 2013 after three years of meetings and negotiations. In support of its objective, it includes provisions that relate to the entire life cycle of mercury, including controls and reductions across a range of products, processes, and industries where mercury is used, released or emitted. This approach could be well suited to be adapted to plastics.

⁴⁹ For more detailed information, please refer to 'Pew Charitable Trusts and SYSTEMIQ (2020): Breaking the Plastic Wave. A comprehensive assessment of pathways towards stopping ocean plastic pollution.'

Over the last years, the political momentum and support for starting international negotiations on a comprehensive global policy framework to address plastic pollution has been growing.

More than 70 leading companies support a call for a new UN treaty on plastic pollution to address the fragmented landscape of regulation and complement existing voluntary measures. Majority of all UN member states from across the world have already officially declared that they are open to considering a new global agreement. As of August 2021, more than 100 national governments have already taken an explicit decision to support establishing an international negotiating committee at United Nations Environment Assembly [UNEA] in February 2022. More than 2 million people have signed the online petition on the WWF website, supporting a global legally binding agreement that involves every country in ending the plastics crisis.

During the Conference of the Parties to the Basel Convention from 29 April to 10 May 2019, Governments already decided to include plastic waste in a legally binding framework which will make global trade in plastic waste more transparent and better regulated, whilst also ensuring that its management is safer for human health and the environment. This achievement is a good signal and excellent starting point to discuss a more comprehensive global policy framework covering the whole lifecycle of plastics, making sure that in the coming decades a circular economy approach to the plastic value chain is implemented around the world.

Evolvement of UNEA global policy response consists of these steps taken carefully to address the issue of plastic pollution

2014 UNEA Resolution 1/6 - Agreeing on the global emerging threat

2016 UNEA Resolution 2/11 - Identifying knowledge gaps

2017 UNEA Resolution 3/7 - Recognising inefficient global governance and finding a common vision

2018 G7 Ocean Plastic Charter - Taking action toward a resource-efficient lifecycle management approach to plastics in the economy

2019 UNEA Resolution 4/6 - Strengthening international coordination and sharing knowledge
G20 Osaka Blue Ocean Vision - Reducing additional pollution by marine plastic litter by 2050

2020 UNEA expert group on marine litter and micro plastics - Including the option of a new global agreement in their final report

2021 International Ministerial Conference on Marine Litter and Plastic Pollution - Supporting the establishment of an Intergovernmental Negotiating Committee at UNEA

2022 UNEA 5.2 - Adopting a resolution mandating negotiations on an internationally legally binding instrument on plastic pollution?

The UN resolution on Plastic Pollution addresses the full lifecycle of plastic from source to sea and is endorsed by the Heads of State, Ministers of environment and other representatives from UN Member States. Plastic production has risen exponentially in the last decades and now

amounts to some 400 million tons per year – a figure set to double by 2040.⁵⁰ This Resolution, is noting with concern inter alia that the high and rapidly increasing levels of plastic pollution represent a serious environmental problem at a global scale, negatively impacting the environmental, social and economic dimensions of sustainable development, noting that plastic pollution, in marine and other environments, can be of a transboundary nature and needs to be tackled, together with its impacts, through a full-life-cycle approach, taking into account national circumstances and capabilities, stressing also the urgent need to strengthen the science-policy interface at all levels, improve understanding of the global impact of plastic pollution on the environment, and promote effective and progressive action at the local, regional and global levels, recognizing the important role played by plastics in society.⁵¹

The Resolution is recognizing the wide range of approaches, sustainable alternatives and technologies available to address the full life cycle of plastics, further highlighting the need for enhanced international collaboration to facilitate access to technology, capacity-building, and scientific and technical cooperation, and stressing that there is no single approach. It is also underlining the importance of promoting sustainable design of products and materials so that they can be reused, remanufactured or recycled and therefore retained in the economy for as long as possible, along with the resources they are made of, and of minimizing the generation of waste, which can significantly contribute to sustainable production and consumption of plastics.

It is also reaffirming the importance of cooperation, coordination and complementarity among relevant regional and international conventions and instruments, with due respect for their mandates, to prevent plastic pollution and its related risks to human health and adverse effects on human well-being and the environment, including the International Convention for the Prevention of Pollution from Ships of 1973. The resolution recognizes that each country is best positioned to understand its own national circumstances, including its stakeholder activities, related to addressing plastic pollution, including in the marine environment, and that further international action is needed by developing an international legally binding instrument on plastic pollution, including in the marine environment.

It requires Executive Director to convene an **Intergovernmental Negotiating Committee**, to begin its work during the second half of 2022 (*with the ambition of completing its work by the end of 2024*), to develop an international legally binding instrument on plastic pollution, including in the marine environment, which could include both binding and voluntary approaches, based on a comprehensive approach that addresses the full life cycle of plastic,

⁵⁰ For more detailed information please refer to What you need to know about the plastic pollution resolution (unep.org), accessed on Dec. 6, 2022.

⁵¹ For more detailed information please refer to the Resolution adopted by the United Nations Environment Assembly on 2 March 2022 - 5/14. End plastic pollution: towards an international legally binding instrument – full text of the Resolution can be accessed at <https://wedocs.unep.org/xmlui/bitstream/handle/20.500.11822/39764/END%20PLASTIC%20POLLUTION%20-%20TOWARDS%20AN%20INTERNATIONAL%20LEGALLY%20BINDING%20INSTRUMENT%20-%20English.pdf?sequence=1&isAllowed=y>

taking into account, among other things, the latest developments on environment (*Rio Declaration on Environment and Development*), as well as national circumstances and capabilities, acknowledging that some legal obligations will arise out of a new international legally binding instrument will require capacity-building and technical and financial assistance in order to be effectively implemented by developing countries and countries with economies in transition.

EU plans and measures adopted on Circular Economy – *the Action Plan*

In March 2020, European Commission adopted the new Circular Economy Action Plan⁵² /CEAP. The Action Plan on CE is one of the main building blocks of the European Green Deal⁵³ / EGD, an EU policy aiming to transform the EU into a modern, resource-efficient and competitive economy, ensuring no net emissions of greenhouse gases by 2050. This intent to overcome challenges on climate change and environmental degradation, which represent an existential threat to Europe and the world, the European Green Deal will economic growth decoupled from resource use. In addition to that, European Commission has adopted a set of proposals to make the EU's climate, energy, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, as compared to 1990 levels.

Circular Economy Action Plan is considered to be the Europe's new agenda for sustainable growth since the EU's transition to a circular economy will reduce pressure on natural resources and will create sustainable growth and jobs. It is also a prerequisite to achieve the EU's 2050 climate neutrality target and to halt biodiversity loss. CE Action Plan announces initiatives along the entire life cycle of products and targets how products are designed, promotes CE processes, encourages sustainable consumption, and aims to ensure that waste is prevented and the resources used are kept in the EU economy for as long as possible.

CE in Albania – *general context*

As portrayed above, the CE despite its relevance in our daily life and the continuous attempt of the NGO's or organizations dealing with environmental protection, unfortunately have been started to address these issues in an institutional level with EU or Worldwide only after 2020. However, it is a great opportunity to start designing and elaborating policies and action plans to address issues of climate change and environment protection, waste management, waste recycling, to make possible the waste loss prevention and ensure that waste is kept within the economy for as long as possible.

Unfortunately, Albania has not yet approved any law or action plan addressing CE issues. However, these issues have started to be broadly discussed in the business community, local communities, NGO's dealing with environmental issues, central governance institutions and university forums for little longer than a decade. A few pilot initiatives have already started in small-scale projects supported by the EU or the Albanian government.

⁵² For more detailed information please refer to Circular economy action plan (europa.eu) / https://environment.ec.europa.eu/strategy/circular-economy-action-plan_en

⁵³ For more detailed information please refer to https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

The circular economy in the case of Albania, is an issue of particular importance, being one from the special components of EU integration and more precisely it is part of the EU *acquis*, namely chapter 27 "Environment and climate change". As a country that aspires to become part of the European integration process, Albania will have to align the legislation in this direction as well, therefore interested parties should be involved and informed about the benefits and problems of this process and how businesses can benefit from this transformation.

The concept of the circular economy was used initially at the draft National Strategy for Integrated Waste Management (2018-2023). Revised Strategy of Integrated Management of Waste is developed on the vision or perception of the concept of "zero waste", so that waste to be collected and treated as raw materials and management to be done in accordance with the concept of circulating systems, serving the criteria of using and preserving resources raw materials. The Strategy Policy Document and the National Integrated Waste Management Plan 2020-2035 main goal, is the transition from the linear to circular economy. The waste collection, treatment as raw material and their management should be done in accordance with the concept of circulate economy.

In 2013, Albania also drafted the law on integrated water management, which, according to EU report, has found little implementation. The 2019 progress report revealed that there were inconsistencies with EU directives for the treatment of urban waste water, drinking water and groundwater and deficiencies in the regulation to strengthen enforcement. The report states that the sewage system and water treatment facilities should be extended to serve a wider area of the urban population and especially coastal cities. Meanwhile, some existing wastewater treatment facilities require rehabilitation to make them more efficient. The 2020 Progress report stated that recommendations provided in 2019 remain valid - Albania showed a level of preparation, however the progress remains slow. Further alignment of policies and legislation with the *acquis*, in several areas including management of waste are needed. Therefore, it is recommended development and capacity building for national agencies.

To sum up, the current legal framework, including national regulations and strategic documents/ action plans, does not provide the basis for the implementation of the concept of economy circulating in Albania. Therefore, there is an urgent need for improvements in the current legal framework that will increase the country's ability to better utilize its resources and the life cycle of materials, products and services. Addressing the circular economy only through management issues of waste shows that the circular economy concept is still in its early stages.

Conclusion

Circular Economy despite its relevance in our daily life and the continuous attempt of the NGO's or organizations dealing with environmental protection, unfortunately has started to be addressed in an institutional level within the EU or Worldwide (UN) only after 2020. However, it is a great opportunity to start designing and elaborating policies and action plans to address issues of climate change and environment protection, waste management, waste recycling, to make possible the waste loss prevention and ensure that these waste are kept within the economy for as long as possible.

It is a systems solution framework that contributes to the delivery of the United Nations' SDGs. The circular economy is underpinned by three principles, all driven by upstream design and

innovation: eliminate waste and pollution, keep products and materials in use, and regenerate natural systems. Increasingly based on renewable energy and materials, and harnessing the power of digital technologies, the circular economy offers a resilient, distributed, diverse, and inclusive economic model.

Circular Economy offers business leaders and government a clear opportunity for long-term growth that is less dependent on cheap materials and energy, and which can restore and regenerate natural capital. It is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution.

Two main documents shaping the policy and states will to address CE issues are the UN Resolution on Plastic Pollution 2022 and EU Circular Economy Action Plan. From now on, the whole world may plan to shift to the implementation of the new policies related to circular economies as the only way out to waste management, recycling and ultimately to climate protection and a better health conditions for everyone.

Currently in Albania, the legal framework including national regulations, strategic national documents and action plans, do not provide the basis for the implementation of the concept of economy circulating in the country. Therefore, there is an urgent need for improvements in the current legal framework that will enhance the country's ability to better utilize its resources and the life cycle of materials, products and services. Addressing the circular economy only through management issues of waste shows that the circular economy concept is still in its early stages.

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“The global economic crisis in the time of the corona virus – Causes, consequences and reactions”

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Abstract

The Covid-19 pandemic has created widespread damage and disruption in all countries of the world. Various countries around the world have implemented measures to protect the lives and health of their people. For months, since the end of 2019, when the Covid-19 pandemic appeared and acted ferociously, the world was shocked, humanity was 'perverted'; the 'economy went downhill' and politics lost its balance. We experienced new phenomena, we were subject to different rules and protocols, and we also used different concepts, methods and actions.

The economic recession and its waves hit the European economy, the Euro zone and then the global economy. Financial markets were severely shaken, even more severely than the global financial crisis of 2008. Governments were 'alarmed' and 'rushed' to approve 'aid' and 'rescue' packages, injecting thousands and billions of Euros or dollars into their economies. . Large state groups, international financial and economic institutions and Central Banks started producing 'recipes' for managing the situation. But the crisis had already happened, it was becoming a fact. The world's largest media groups had and still continue to headline their announcements on the 'Corona virus Pandemic' and its consequences, the economic, financial and global crisis, unemployment and poverty, a world that changed very quickly highlighting the most challenging big for the future. We all started thinking about tomorrow. When will this crisis end? What will happen? What will change? How will it be? Don't wait. Ride with the change. Tomorrow will surely be better.

Keywords: Global Crisis, Corona Virus, Economic Consequences, Unemployment, Inflation

Introduction

The coronavirus did not ask about state borders, nor about border "walls". Its economic consequences transcended the borders of any country. The Covid-19 pandemic was presented as a global problem that required a global solution. It shocked the whole globe and alarmed all the states.

This shock and this entire period that we experienced will be remembered not only now in these 'gloomy' and economically, financially and psychologically burdened times, but also after one or a few years, when 'the world will be different', not only must this time be recognized and remembered, but must be fought and tried every day, so that this does not happen again, constantly reflecting in the name of a better and safer world.

This paper aims to analyze and interpret much of the journey with this economic crisis provoked by the global pandemic of Covid-19, interpreting the causes, the results from its consequences and the different reactions of people in general.

The topics covered and the sub-topics are the result of a long and continuous work in the research and study of the current situation regarding the issue of the crisis caused, where the great crises of modern capitalism, the various dilemmas, the journey with the crisis in this period, its impact and conclusions in the form of lessons that this experienced situation has taught us.

Crisis - Human Fault Or Structural Feature Of Capitalism

Financial crises are not a new or unknown phenomenon. During the last centuries, they have appeared one after the other, creating the impression that no one has wanted to learn and draw the right conclusions both about the causes of their birth and about the consequences, often catastrophic for countries, continents or the entire globe. It seems as if they have been and will be the permanent companions of development and capitalism. This is so true that in most books or studies devoted to economic, financial and monetary crises, their last sentence is almost the same in the form of the question: what is expected to be the next crisis?

In all cases of these crises, the conclusion on their causes was almost the same: the neglect of the phenomenon of financial speculation as a result of the euphoria about the unlimited possibility that money and the financial market can create. Human fault or structural feature of capitalism? Difficult question, which has been given a variety of answers. However, financial crises continue. The last, the Covid-19 crisis, with many unknowns, many unexpected and global scope.

The first financial crisis of the modern world, which is related to the real existence of the market and capitalism itself as a system, appeared in 1634 in the Netherlands under the strange name: 'The Tulip Crisis'. Later, during the period of the first industrial revolution in England and France, dozens of crises appeared in the years 1720, 1797, 1810, 1825, 1836, 1847, 1866, etc.

But also other countries such as Russia in 1882, Austria-Hungary or Germany with its hyperinflation in 1923 that have had their crises. **54**

Meanwhile in the USA, the first financial crisis appeared in 1819 until the arrival of the most terrible crisis of capitalism in the century. XX, the Great Depression in the years 1929-32, as a result of the bankruptcy of the New York Stock Exchange, which is considered the most tragic and shocking event in the history of stock exchanges and financial markets. The days of the occurrence of this crisis were named as: 'Black Thursday of October 24', 'Black Monday of October 28' and 'Black Tuesday of October 29' - the symbolic dark days of this presented crisis. The economic consequences of this crisis were: lower prices, bankruptcies of banks and businesses, reduced consumption, devaluation of the currency, extraordinary unemployment, disappearance of political regimes, etc.**55** The financial crisis of 2007 began in a segment of the American real estate market, caused by the failure of subprime loans, quickly transforming into a banking and stock market crisis, the signal of which was mainly given by the bankruptcy of the major American bank 'Lehman Brothers' ' in September 2008.

And so in a row, in these last 4 centuries, over 40 financial and monetary crises have occurred, including here and the most current one such as Covid-19, which seriously shocked and frightened the whole world for the terrible consequences it caused in the entire economy and finance world.

Coronavirus - The Beginnings Of The Global Crisis And Facing It

Many economic ideas and proposals, in different circumstances, require political decision-making and the consideration of many circumstances and many factors. This has happened and is happening in most countries, even in our country, where the "Coronavirus Pandemic has plagued" the population of the globe, taking the lives of thousands of them. And not only that. Covid-19 also served as a 'spark' to bring to the surface the shock of the global economy. And immediately began the debates of economic opinion, how they will face the crisis of the global economy that is expected.**56**

This emerging global economic crisis had 'knocked on the door' almost a year ago. For this there are theoretical arguments and concrete data as well as special factors or circumstances. First, it is theoretically argued and practically proven in global economic developments, its development cycle, the curve, once in 10-12 years, touches the point of decline towards recession and the crisis appears. This has happened since the Crisis of 1929-1932 until the last crisis of 2008. This is how it seems to be happening now.**57**

Second, the indicators of the development of the global economy last year marked a noticeable decline, a warning signal for an expected shock. Thus, according to the data of international institutions, IMF, OECD, etc., the world economic decline is expected to mark an economic

54 Kilian Rieder (2020) What we may learn from historical financial crises to understand and mitigate COVID-19 panic buying, 20 April 2020 (CEPR Policy portal)

55 Bernstein, S, J Lerner, and F Mezzanotti (2019), 'Private equity and financial fragility during the crisis', *Review of Financial Studies* 32 (4): 1309-1373

56<https://moderndiplomacy.eu/2020/04/22/impact-of-covid-19-on-global-economy-structure>, aksesuarmë: 10.05.2022, 20:20

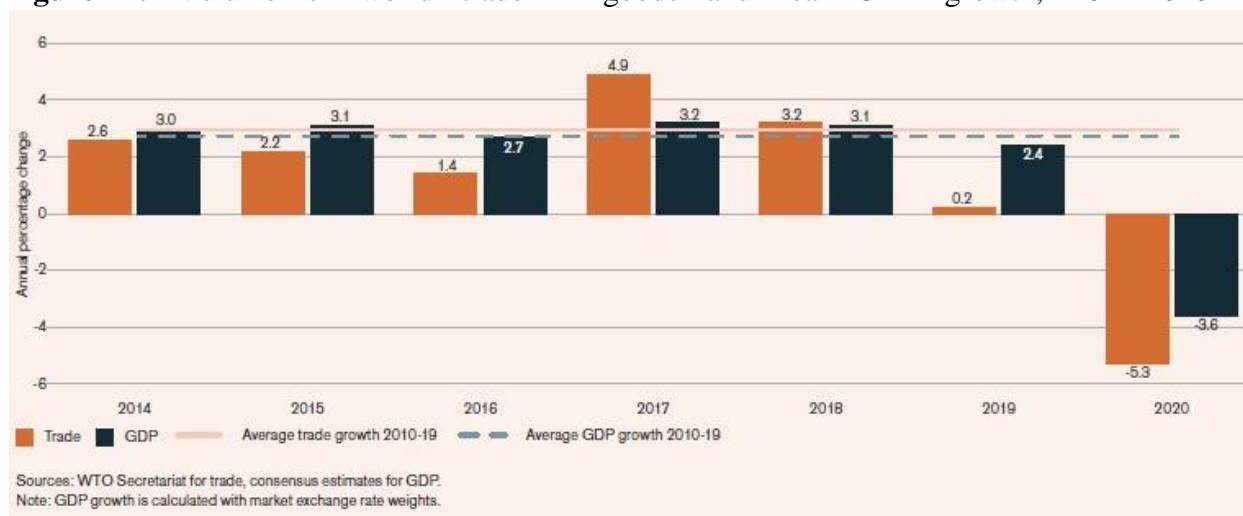
57 Fitch Ratings, Global Economic Outlook: Crisis Update May 2020- Coronavirus Shock Broadens, Tue 26 May, 2020.

decline of almost 2.4%, falling into recession. This is because the big economies are expected to decline, ie China, USA, England, Italy, France, Germany.⁵⁸

Third, the gap in the standard of living of the world's low- and middle-income population widened. The current situation is developing in the conditions of reaching the peak of the development of economic, commercial, cultural globalization, when the technological, scientific, innovative development is dizzying in these last 2 decades, when the "trade war" has increased, the financial markets have become more influential "financial speculations" have not been missing, etc. To this situation we must also add the growth, on the one hand, of anti-globalist movements and, on the other hand, of the movements and ideas of economic and political nationalism.⁵⁹

Fourthly, since the beginning of 2020, the globe was affected by the Covid-19 pandemic, one of the most "wild" humanitarian pandemics with consequences that unfortunately took human lives. The crisis of 2008 was not confused with any humanitarian or health crisis, nor did it turn into one and did not lead to the loss of human lives. This health and humanitarian crisis, but rapidly turning into an economic crisis, paralyzing economic and social life in most countries, "woke up" from its sleep, shaking the global economy by hitting supply and demand hard. Covid-19 is the biggest threat factor above all crises of the emergence and now also of the expected acceleration and deepening of the global economic crisis.⁶⁰

Figure 1: Volume of world trade in goods and real GDP growth, 2014-2020



Source: WTO Secretariat for Trade

⁵⁸ OECD Policy Responses to coronavirus (COVID-19)- Supporting businesses in financial distress to avoid insolvency during the COVID-19 crisis, Open PDF 27 May 2020.

⁵⁹ https://www.ilo.org/global/topics/coronavirus/impacts-and-responses/WCMS_745963/lang-en/index.htm, aksesuarmë: 05.05.2022, 18:00

⁶⁰ Irfan Mahar (2020)- Impact of Covid-19 on Global Economy Structure; Published April 22, 2020, By Modern Diplomacy

Covid-19 Damages GDP, Affects And Other Indicators: Employment, Poverty, Welfare, Environment, Innovation

The measurement of economic performance and social progress is insufficient and incomplete. This leads to misleading conclusions about people's well-being, leading to wrong policy decisions. The Covid-19 crisis, where almost everything in terms of its impact, damages and coping, is being linked almost exclusively to the GDP level, highlighted even more the need for a more concrete and real measurement and expression of economic performance and welfare.⁶¹

GDP growth is considered as an indicator for the growth of wages, consumption, well-being, economic-social development of a country or even more widely, the world economy. The main international institutions such as: IMF, World Bank, OECD, etc., or any government, compares its success or facing criticism with the economic growth figures it achieves. In relation to GDP in percentage, the following are calculated: Public debt, budget deficit, public investments, foreign direct investments, fiscal burdens, bank loans, etc., where then, depending on their results, the state of the level of employment, poverty in the state follows, well-being and standard of living of citizens in general, etc.⁶²

For that, we say that GDP is more than an indicator, because it represents a model of society that has influenced not only economic policies, but also political and cultural processes. People's lifestyles are generally defined by the continuous cycle of consumer production, simplified by BPV. This indicator in the economy is the one that has 'colonized' the language of government and the division of power at the world level, it is so important for a state. Its inadequacy means the end of people's well-being, leading to wrong political decisions. A country could destroy its social system, waste its natural resources, irreversibly pollute its ecosystems, and still its GDP would increase by recording these abuses as economic progress.⁶³

From the studies of the characteristics and content of economic growth in RNM, in response to various questions and dilemmas regarding this issue, a series of problems that 'portray' our economic growth and its defects are highlighted, for example: growth of political conflict, substandard economic growth that is represented and influenced very little by technical progress, new technologies, business sophistication, developed industrial sectors, the level of productivity in the country, etc.; non-inclusive economic growth, but with pronounced exclusionary features, in relation to territorial distribution, different social groups, etc.; economic growth that translates into difficulties in welfare and employment; economic growth not at all friendly to the environment, renewable energy, quality of life, etc.⁶⁴

A DIFFERENT CONCEPT ON GLOBAL RISK, BUSINESSES AND THE NEED FOR RESTRUCTURING IN THE ECONOMY

⁶¹ Adams-Prassl, A, TBineva, M Golin and C Rauh (2020) 'The large and unequal impact of COVID-19 on workers', VoxEU.org, 8 April.

⁶²<https://datatopics.worldbank.org/universal-health-coverage/coronavirus>, aksesuarmë: 07.05.2022, 13:56

⁶³ COVID-19 Pandemic in the World of Work – ILO Monitor: COVID-19 and the world of work.

⁶⁴ Scott Baker, Nicholas Bloom, Steven Davis, Stephen Terry (2020)- COVID- induced economic uncertainty and its consequences; CEPR Policy portal, Research-based policy analysis and commentary from leading economists, 13 April 2020

The Covid-19 pandemic brought to the attention of the global economic debate again the problem of risk measurement in new forms and under new conditions of the pandemic. The main conclusion is that 'extreme circumstances', represented by emergencies such as the coronavirus, seriously question the degree of resistance of our systems. For this reason, it is necessary to find a multilateral solution with a new risk management approach, in order to limit the negative effects on the socio-economic structure. Coordinated measures are essential to avoid the risk of a more severe economic crisis.

The beginning of the discussion to find the answer on how to reduce the level of risk with state policies, mainly contains these elements of the factorial analysis with the basic factors such as: the number of employees, the management of the amount of investment or subsidy, the level of the multiplier that this financing can generate, etc. In general, all economists and experts in various economic fields agree that the contribution to employment and the stimulation of the necessary consumption demand should be the determining factors.

The financial packages of all countries have already become known to inject their economies in the face of the Covid-19 pandemic and to curb the recession and crisis of the national and global economies. Many interstate bodies built systems to promote loans for small and medium-sized businesses in colossal amounts, with the aim of preserving jobs, slowing the economic decline, but above all the controlled development of the restructuring of the economy. **65**

As a result of this, it is emphasized by many economists that we will have radical changes in economic structures, forms of development and in the concept of wealth, even in international economic relations. There are many other economists who think that businesses using low-cost financing will realize their business restructuring much faster. The most typical example of this was in China, where a car manufacturing company in bankruptcy restructured its production in medical materials and in 2 months managed not only to cover losses, but also to become a leader in the health materials sector. This period has also significantly increased online shopping, where this measure will bring about a fundamental change in the digitization of business with an unprecedented development of the industry. **66**

All these are messages that tell us that maybe some rules of the free market economy should be changed. Policies must be built to fight monopolies, which lead to the imbalance between employees and large companies operating in the market, a transparent co-governance activity must be built starting from governments, the business community and civil society, it is required to invest more in health, social issues, science, technology, education and innovation.

Lessons From The Covid-19 Crisis

A wide discussion has included not only the issue of Covid-19 as a health problem, but because of the consequences it brought to the economy causing a global economic crisis. The pandemic unfolding and being experienced by each of us, many new lessons and experiences are emerging from this complex crisis situation, involving the state and its policies, the social

65 IMF COUNTRY FOCUS- IMF Offers Emergency Support to the Balkans; May 12, 2020.

66 BIS (Bank for International Settlements Bulwtin nr.7, 2020)- Frederic Boissay and PhurichaiRungcharoenkitkul- Macroeconomic effects of Covid-19: an early review.

concept on health and of course the economy, which is experiencing the biggest crisis and more severe after the 'Great Depression'.

The first lesson is the fact that it is better understood and there is a high level of awareness, regarding global cooperation, against this deadly pandemic and to face the uncertainties we are experiencing. So regarding this issue, we must understand that this level of globalization and all the evaluations so far show that the phenomenon of globalization is a solution and not a problem.

Second lesson, is the fact that in this crisis we learned that policies must be built that fight monopolies, collective activities must be built starting from governments, the business community and civil society and this teaches us that we must go on the journey towards digital capitalism.

Third lesson, is that this crisis taught us that everyone must be aware, understand and implement the fact that health is a global public good and as such must be guaranteed and financed with priority not only in pandemic cases, but also in normal cases.

Fourth lesson, that equality as a result of public health is a fundamental result of the welfare state, as well as a constitutional objective for all democratic countries, and as such should be recognized as a political priority of governments for economic, social and healthcare for the pandemic era.

Lesson 5, that the pandemic is not and will not be the only case and that we must understand that science, education, technology, innovation, artificial intelligence require a lot of attention and investment, because without them we cannot even withstand the development that it is happening to the future, but not to phenomena like the coronavirus.

Lesson 6, is that the need to face this global economic crisis has highlighted the issue of restructuring economies, policies, strategies and priorities of economies. So the need for changes in this part as well, in the types and models of businesses, in the assessment of their risk and with the news of the labor market, become more necessary than ever.

Lesson 7, is the dilemma of whether debts or inflation will increase, so if debt increases, children will have fewer obligations and if inflation increases, the poor will become poorer and the rich richer. In a world where Covid-19 requires social equality, this decision is not easy to make, at least the two indicators should be balanced.

Lesson 8, is that tomorrow after the disappearance of this virus, nothing will be the same as before, social behavior will change, behavior with each other, towards health education, attitude, approach to many phenomena of economic life and social etc. etc.

Lesson 9, is that there must be developments in global and national security policy.

Lesson 10, is that opening plans should be made to resume normal life and curb the consequences of this crisis and that this situation should be seen as an opportunity to work and live differently and better.

Conclusion

No major or significant event since World War II has had such a profound global impact as Covid-19. The pandemic has created a health and economic crisis on a scale unknown for generations before, while it is adversely affecting, exacerbating a number of problems of a systemic nature, such as socio-economic inequalities and attitudes of great powers.

The only acceptable response to such a crisis is to think and act towards a "Great Restart" of our economies, policies and societies.

The reactions and measures taken all over the world undoubtedly gave the first positive effects in weakening the virus of this pandemic. While the economic and social wounds are leaving heavy marks everywhere.

This crisis taught us to build a different future. Different in health care, health service and institutions, social and humanitarian support, education and training, attitude to the environment and climate change, natural disasters and pandemics, in our daily life and behavior.

A new look is expected to include economic issues, the restructuring that will take place, the role of science and technology, innovation and digitalization. Changes will occur in various personal and public services, where digital services will receive more priority and preference. The financial-banking system, financial markets, the use of money will be affected by profound changes. International security issues will broaden their vision. All of these are the result of a global reaction to this global evil that happened.

So the question should not only be how the power of this crisis can be controlled, but also who will decide who will have the power to fix this situation that is taking over almost every aspect of our daily lives.?

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Crochet: Weaving magic for eco-friendly crafting and sustainable livelihood

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Abstract

As per the United Nation Environment Program reports textile industry is leaving a deep and damaging impact on the environment given the harmful process such as bleaching, dyeing, etc. involved in the production. It is contributing to 2 to 8 percent of global carbon emission. And thus, there is a dire need to radically change not only the patterns of textile consumption but also the consumer attitude and mindset. Craft has a long history of being highlighted as an important pathway to more sustainable future, and with increased environmental pollution, there is a dire need to adopt sustainable methods and techniques, primarily in the textile industry order to save environment and to foster sustainability. Thus, this conceptual study employing observation method explores 'crochet' as a sustainable craft. It also provides an overview of crochet craft highlighting the major techniques & tools and benefits. Further, it examines crocheting through the lens of the Triple Bottom Line Theory (TBL) framework, which focuses on three dimensions known as people, planet and profits. The Findings indicate that crotchet can be classified as an eco-friendly craft or a sustainable craft, and is being used as a means for earning sustainable livelihood.

Key words: Crochet, sustainable craft, eco-friendly craft, sustainability, observation method

1. Background

The idea of sustainable development was introduced by the UN General. Accordingly, sustainable development is described as a social process in which ecological, social and economic processes are regarded and studied as three interconnected yet mutually reinforcing components of development (WCED, 1988). It has been observed that textile business has a major impact on the environment as the current practises are unsustainable; and corporations, environmentalist and consumers are looking at strategies for lowering the textile carbon footprint. So, there is a critical need to manufacture and promote eco-friendly textile materials.

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1.1. Introduction

1.2. Sustainable Development

The UN's overarching paradigm is based on the idea of sustainable development. Sustainability is defined as "development that fulfils the demands of the present without compromising the ability of future generations to meet their own needs" by the Bruntland Commission Report (1987). The four dimensions of Sustainable development are (refer Figure 1):

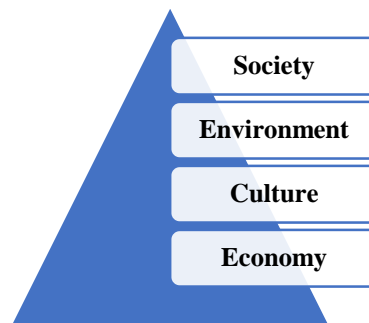
Society

Environment

Culture

Economy

Figure 11: Four Dimensions of Sustainable Development



Source: Original

In order to achieve long-term sustainability, it is necessary to consider all four of the following aspects: society, environment, culture, and the economy as a whole. Think of sustainability as an approach to the future where environmental, social and economic factors are balanced in the pursuit of a better quality of life. Providing food and resources, safe drinking water, and clean air are just a few of the benefits that a healthy environment brings to a community. Using the TBL framework and the dynamic capability view, Andersson et al. (2022) explain how economic, environmental, and social goals are interconnected and contribute to sustained competitive advantage. There is increasing demand on firms to decrease their environmental footprint and support sustainable development. (Schaltegger et al., 2019). Businesses should approach value creation from all three angles, namely social, environmental, and economic, in order to ensure their long-term viability.

1.3. Sustainable Craft

It's common to think of craft as something that's built from scratch and authentic. Frayling defines sustainable craft as "handmade," "hand-finished," and "made by our artisans" in his book, *On Craftsmanship: Towards a New Bauhaus* (). Often, the phrase "organic," which is frequently connected with craft, appears alongside these words. The term "craft" can refer to a category, an object, or a concept; it can also refer to a method of doing something. Craft, according to him, is "the art of doing anything well by means of manual skill. The authors of this study have defined craft as the application of skill and material-based knowledge for small-scale production purposes. Produced entirely or in large part by hand, with or without the aid of hand tools or other mechanical means, provided that each individual artisan's direct handiwork contributes significantly to the final product's overall design and functionality. Craftsmanship has a special quality because of its unique features that can be utilitarian, artistic and creative as well as culturally inclined and beautiful as well as traditional and spiritually significant as well as functional.

1.4. Crochet: A Sustainable Craft

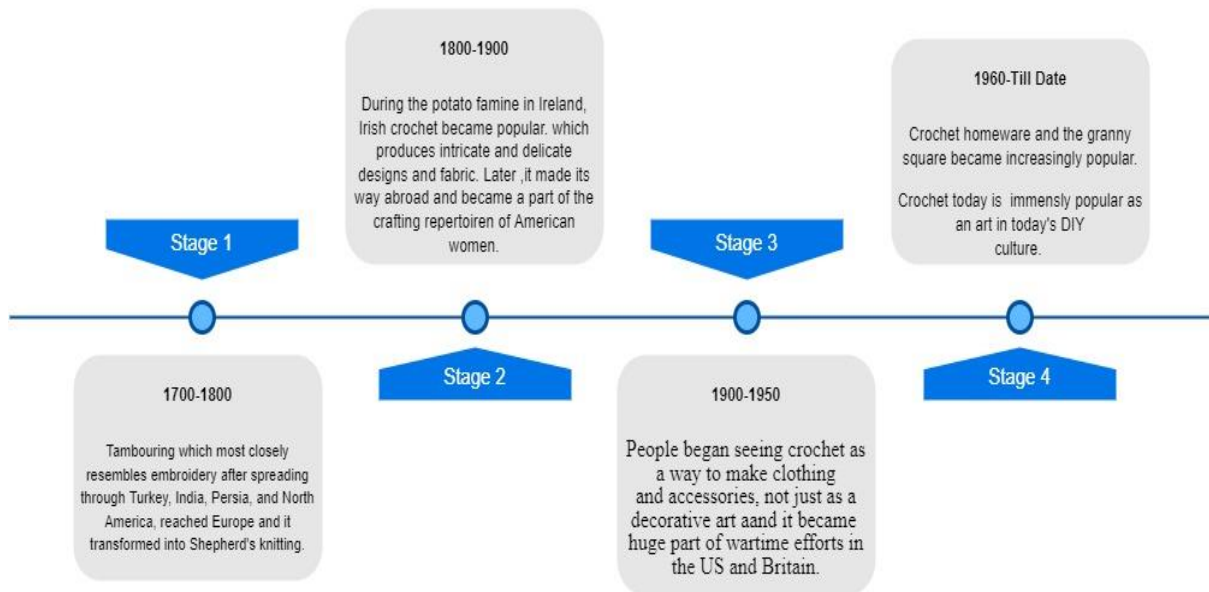
Crochet is the art of creating a textured fabric using yarn and a single hook, has been carried on since the 16th century. Skilled hands make intricate designs through the hypnotic in & out movement of a hook, therapeutic in itself, while finished products lend themselves to an immense sense of personal accomplishment. Crochet uses a single, hooked needle for dragging a yarn or thread through interlaced loops to make a textile or practical object. Throughout history, Crochet is known by various other such as netting, knotting, needle-coiling, etc. Some of the popular crotchet techniques include Tunisian crochet, Irish crochet.

1.5. Evolution of Crochet

Crochet is a centuries-old skill that has long been enjoyed by women as a way to pass the time. Crochet needles and thread are used to create a type of lacework. A cheaper alternative to crochet cotton threads is to use regular woollen thread, which is commonly used in knitting. Although there is no concrete evidence, a missionary couple from Scotland, are credited with the introduction of crochet to India in the early 20th century. Initially used for prayer rugs & caps within the Muslim community and in Christian ceremonies, crochet has transcended all boundaries and become popular across the country. Women in India took to crocheting with ease, possibly on account of their inherent predisposition to craft

1.6. Crochet History Timeline

Figure 12: Crochet Time line



Source: Original

1.7. Tools for Crochet

All kinds of materials, from hair to grasses to reeds to fur and sinew to hemp to flax to wool to silk to white cotton thread have been used to weave crochet throughout history. Other materials utilised in the process of weaving crochet include mohair and chenille. Materials such as gold, silver, copper strands, plastic strips, pieces of cloth, unprocessed wool and even dog hair can be used as crochet threads. Crochet hooks have been made from bones, animal horns, metal, and wood, and even spoons.

1.8. Techniques for Crochet

There is a learning curve to crochet, so patience and perseverance. Most commonly used crochet stitches for beginners include single crochet, double crochet, half double crochet, and triple crochet stitches.

2. Literature Review and Theoretical Framework

2.1. Sustainable Fashion Consumption

"Conjuring the demands of the present without compromising on the needs of the future generations to meet their needs may be generally defined as sustainable development" (Brundtland, 1985). Social and environmental considerations act as a guide for both producers and consumers, guiding them in their decisions. It's been noted that sustainable fashion consumption is typically understood as green or ethical or recycled or ecological (Hargreaves, Nye & Burgess 2008). According to some research, it can be translated as "eco-fashion," which refers to clothing that is intended to be worn for an extended period of time (Joergens, 2006). Currently, "high-quality and well-designed products that are environmentally sustainable, benefit underprivileged groups, and reflect excellent working conditions for the workers or labourers" are being referred to as "sustainable fashion" (Domeisen, 2006). As a result,

sustainable fashion consumption is part of a larger system that includes consumer attitudes and behaviours. Buying, wearing, mending, and recycling fashion items have less of an influence on the triple bottom line (the economy, the environment, and society).

2.2. Sustainability in Fashion: An Anomaly

It is really impossible to make a social or environmental impact on context of fashion industry which is considered to highly unsustainable, given its processes and value chain. It is difficult to associate fashion with concerns for environment as both are strikingly apart. Caring for the environment, making use of recyclable packaging, saving on carbon footprint during travels and decreasing wastage in any form, all seem to be far away from the world of fashion (Ivan, Mukta, Sudeep, & Burak, 2016). The growth and the revenue of the fashion industry depends largely on four-seasons collection and thus, makes it impossible to satiate the environmental concerns. The fashion industry has a humongous capacity to cultivate wants as consumer needs and they all the time feel obligated to replace their clothes, even if they haven't been worn (Ertekin & Atik, 2015). As per the UNEP data, the waste record of the industry is alarming, with several tonnes of clothing filling up landfill sites across many nations of the world. Many companies have the practice of dumping unsold stock rather than recycling it. Waste is primary challenge in the fashion industry, and has worsen in recent years, as production costs have fallen and consumption has risen (Cassidy & Han, 2013). Government, intergovernmental, and international institutions alone cannot guarantee environmentally sound growth. Non-governmental environmental and development groups and the scientific community are among those that must participate. Environmental education and awareness, and the design and execution of programmes at the grassroots level, are two areas where non-governmental groups can make significant contributions.

2.3. Theoretical Framework: Triple Bottom Line (TBL)

The concept of "triple-bottom-line reporting," proposed by John Elkington, has recently received a lot of attention (1994). It is defined as reporting that includes information on economic, environmental, and sociological issues. In contrast to the traditional approach of assessing only the financial bottom line, Triple Bottom Line Framework (TBL) refers to a way of measuring an organization's economic, environmental, and community service impacts. Sustainable development entails pursuing economic prosperity, environmental quality, and social equality all at the same time. It focuses on the societal value that an organization's operations or company creates or destroys. Richardson (2004) identifies two high-level components of the TBL framework in one of the investigations. The first is a financial restatement of traditional accounts; the second is supplementary accounting to demonstrate the financial worth of economic, environmental, and social performance to external stakeholders.

3. Research Objective

The primary purpose of this research to examine the art of crocheting as a sustainable craft and highlight its benefits. The manuscript aims to examine crocheting in context of the Triple

Bottom Line (TBL) framework and propose its utility as a craft which can be valuable to the society, economy and environment.

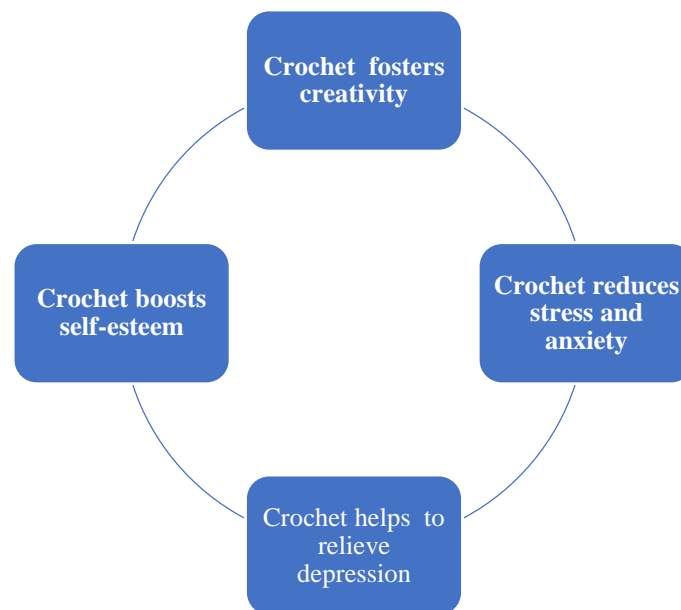
3.1. Research Methodology

This conceptual research presents a synthesis of the various research papers, articles, blogs and reports published by national and international agencies. For this study, the information was gathered from databases such as Google Scholar, SAGE Open, and Emerald. Further, the research also presents a summary of the observations of the authors while mentoring and coaching a self- help group of women artisans involved in crocheting. The mentoring and coaching were conducted as part of a consultancy project undertaken by School of Business Studies in collaboration with Mon Ami and HCL Foundation.

4. Findings

The set pattern of the crochet craft makes it a great tool for de-stressing in multiple ways, first it can inspire focus and reflection. Second, the craft also lend to social interaction with a group. it provides a sense of community and togetherness. Crochet is not only considered as a hobby craft but also as a therapy for Mental well-being. Some of the benefits of crocheting include (Refer figure 3)

Figure 3: Crochet for mental well being



Source: Original

4.1. Crochet for mental well being

Crochet fosters creativity: To express creativity through crochet, all one need is a yarn and a needle. Mind becomes more peaceful and devoid of nervous notions and thoughts by focusing on the repetitive actions of individual stitches and counting rows.

Crochet helps reduce the risk of mental diseases, stress and relieves depression: It has been proposed that by doing cognitive exercises and exercising the mind, memory loss can be slowed or even prevented. Scientists now believe that activities like crocheting can make people feel better by stimulating dopamine release. Crocheting causes the release of dopamine, a neurotransmitter that impacts human moods and acts as a natural antidepressant

Crochet Boosts Self-Esteem: Creating a project to give as a gift or sell at a craft fair brings in a small amount of external reinforcement. And can significantly enhance individuals' self-esteem.

4.2. Crotchet for Sustainability

Crocheting as a craft very well links with the concept of sustainability. Notions such as up-cycling, recycling, waste minimisation and material optimisation lie at the heart of traditional craft and the same is true for crocheting. These aspects, which define sustainability, are intrinsic to the continuity of women's craft. Crochet a craft not only skills people to earn for their sustenance but also propagates the 'vocal for local' call thereby contributing to the fulfilment of mission India to become self-reliant ('Atmanirbhar'). Along with promoting traditional crochet craft, the focus is also on the well-being of the craftspeople. Most of the organisations involved in crocheting majorly employ women. These women are usually organised by means of self-help groups, thereby creating local ecosystems. Also, product – market linkage is done through self-sustaining mechanisms and mostly employ social media for selling and promotion. Generally, migrant women are trained in the craft to earn a sustainable livelihood through online skill building sessions. The craft does not require harmful processing, thus, ensuring that these products have a negligible carbon footprint. Further, the endeavour is to create customised products, as opposed to mass manufacturing. Crocheting is a manual technique; thus, every single product is handmade and hence, tells a unique story. With the purchase of every product, an emotional connect is formed between the maker and the user.

Figure 4: Images of Crochet Products: Reuse and Recycle

Source: Original

4.3. Crochet for Sustainable Environment: Upcycle, Recycle and Replace

Upcycle: With Crochet, old garments can easily be transformed in a variety of ways to avoid wastage. Thus, instead of tossing unused items into garbage where they very likely end up into a landfill, add a crochet edge to spruce up an old garment, or transform it into something completely new.

Recycle: Crocheted products can be frogged, and yarn can be reused to create something new. It can also be repurposed, for instance, turning an old crochet dishcloth into a cleaning rag —

Replace Disposable Items: Plastic and leather usage can be reduced by replacing commonly used products such as mobile covers, coasters, bags and purses with reusable and recyclable crochet products.

4.4. Crochet for Livelihood

Crochet, lately, has been popularised not only as a hobby but as a skilled craft to earn a livelihood. The authors have undertaken a consultancy project to mentor and coach women artisans involved in crochet for leadership and entrepreneurial skills. Most of the women, part of these Self- Help groups are migrants, coming from rural and impoverished areas of the state of Bihar. Although migrant women have been displaced, crochet allows them to reconnect with their intrinsic skills and create products by hand. From their observations, authors can propound that crochet, is useful, especially for women to earn their livelihood. Some of the major reasons that make crochet a more suitable means of livelihood for women include:

No or Low investment proposition

Easy to teach and learn

No Age restrictions

Life- long learnings

Provides a sense of community – working in self-help groups

Option to conduct remote training through technology

Remote work/ Part – time work – Women can easily work from home in their free time to earn or add to their income

The project was undertaken with Mon Ami foundation, a non- government organisation (NGO) based out of Delhi NCR and involved in skilling of the migrant women in the art of crocheting.

The project aimed to achieve the following objectives:

Promote leadership qualities and income-generating activities among participants.

Improve the quality of life and socio-economic status of the participants by making them self-reliant.

Organise External sessions with experts in Social Sector for participants capacity building

Conduct real time sales sessions at the University Campus to give hands on sales exposure to the participants.

4.5. The Interventions

The Leadership & Mentoring Training was imparted through an active participation of the members to build their capacities and competencies. Following are some of the interventions undertaken:

Team Building sessions

Artisans Exhibitions/ Visits to “Haats” (Artisans’ Market Place – a measure of Ministry of Minority Affairs to provide the highly talented artisans and craftsmen a place where they can showcase and promote their skill and talent)

Guest Lectures by SMEs

Online mentoring & Coaching

Figure 5: Glimpses of women Artisan's exhibition to sell Crochet products



Source: Original

A series of exhibitions led by women artisans were organised with the following purposes:

To enable CRPs (Community Resource Persons) to manage the group with better understanding of the “Leadership Concept”

To build CRPs capacity to lead and train other women (Train-the- trainer mode).

To boost participants’ self-confidence and morale

To foster the spirit of Entrepreneurship

To provide hands on marketing exposure to the artisans

To help artisans to get acquainted with the process of direct selling

To create awareness and promotion of “Green products” among masses

5. Conclusion:

It is evident from the findings that crochet is evolving as a sustainable craft as the products can be easily reused and recycled. At the same time, given the basic instinct of the fashion industry, it calls for the overt acceptance from the masses. As transition to more sustainable measures requires a major change and reorientation of ways of thinking; lifestyles; consumer patterns and values. Promotion of Sustainable craft is one way of dealing with the issues of sustainability.

6. Practical Implications

The research highlights the benefits of Crochet as a sustainable craft. Policy makers at the national and international level can promote such crafts to enhance the livelihood of the marginalised segment of the society, specifically women. Further, Policy- makers, specifically

in countries where there is a persistent problem of poverty, especially rural poverty can install income- generation activities and micro enterprises in the rural areas. This will help promote first-generation micro entrepreneurs through Self – Help groups thus catering to the eighth sustainable development goal (SDG) related to the economic growth.

7. Limitations of the Study and Future Research

This conceptual study primarily relies on the secondary data and observation method and further needs to be examined in the light of the first-hand information. Thus, this can be used as an anchor for the future researches to examine the art of crocheting as a sustainable craft empirically

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Transfer of the Risk of Extreme Weather to the Financial Market

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Abstract

This The research undertaken aims to indicate the possibility of securing against the risk of extreme weather events by transferring this risk to the financial market. The work uses a research method based on interdisciplinary literature studies in the field of finance, economic geography, and management. The literature review process consisted of several successive stages. The first step was to formulate the research problem, collect and evaluate the relevant data, analyze and interpret the collected data, present the data and present the directions for further research. In this article, a narrative review of the scientific literature was carried out to identify the available financial instruments hedging against weather risk and to present the main advantages and disadvantages of these instruments in the conditions of dynamic climate change.

At the stage of formulating the research problem, the criteria for the selection of publications included in the literature review were also defined. The idea was to use the latest possible publications on the risk of weather and weather financial instruments. Moreover, special emphasis was placed on the analysis of the rich literature on the subject.

The results of the analysis show that in practice there are many tools to protect against the risk of extreme weather events, thanks to which this risk is transferred to the financial market. These instruments include weather bonds, weather insurance in an insurance company, and weather derivatives. All these instruments have their advantages as well as disadvantages. Hence, it can be concluded that there is no ideal, universal instrument thanks to which the weather risk is transferred to the financial market, which would be appropriate in every situation, because the possibilities of effective use of these instruments in practice depend on many factors, such as the scale of extreme weather phenomena, the level of economic development of a given country and the state of development of the financial market, or the knowledge and experience of entities hedging against weather risk.

Keywords: weather, risk, financial instruments, risk transfer, financial market

Jel Code: Q56, D81, G32, E44

1. Introduction

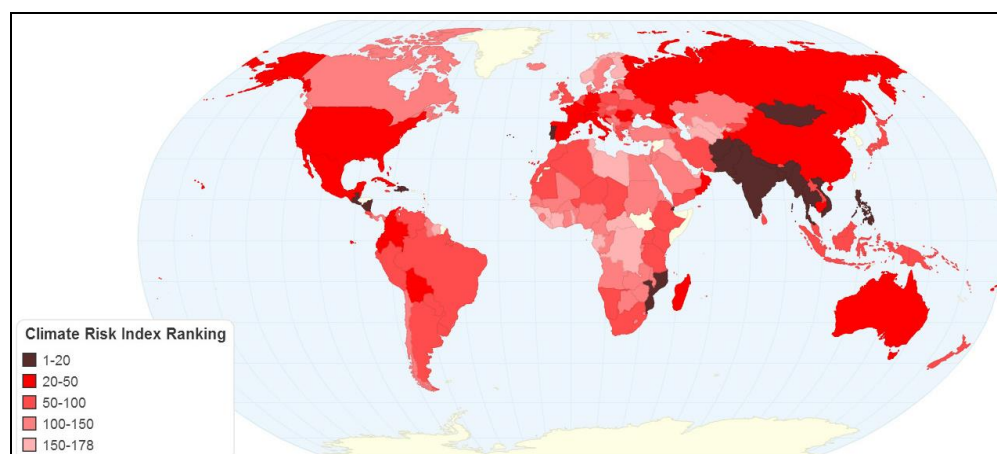
Climate change significantly affects all parts of the world. Contemporary natural hazards, also known as natural disasters, causing significant human and material losses, include earthquakes, hurricanes, storms, weather anomalies, epidemics and epizootics, prolonged droughts and fires, and floods. Extreme weather events in particular are increasingly threatening the economic situation of households and businesses around the globe. Protecting themselves against the risk of extreme weather phenomena by these entities is one of the instruments of society's adaptation to climate change. This is an extremely important problem that the governments of many countries in the world are involved in solving by introducing appropriate procedures, the so-called crisis management.

Global warming is melting glaciers, leading to rising sea levels. In some regions, extreme weather events combined with rainfall are becoming more frequent, while other regions suffer from severe heat and droughts. Extreme weather events, heavy rainfall, and other sudden weather events are becoming more common.

The extent to which countries have been affected by weather-related losses (storms, floods, heat waves, etc.) is presented in the Global Climate Risk Index (CRI). The Global Climate Risk Index is an analysis based on one of the most reliable data sets available on the impact of extreme weather events and related socio-economic data.

The Global Climate Risk Index (CRI) developed by Germanwatch analyzes the quantitative effects of extreme weather events, in terms of both fatalities and economic losses, based on data from Munich's Re's NatCatSERVICE, which is one of the world's most reliable and complete databases on this issue. The CRI analyzes both absolute and relative effects and results in a country's average ranking on four indicators, with more emphasis on relative indicators. The countries that rank highest are most affected and should see the CRI as a warning sign that they are at risk of frequent events or rare but extraordinary disasters.

Figure 1. Global Climate Risk Index

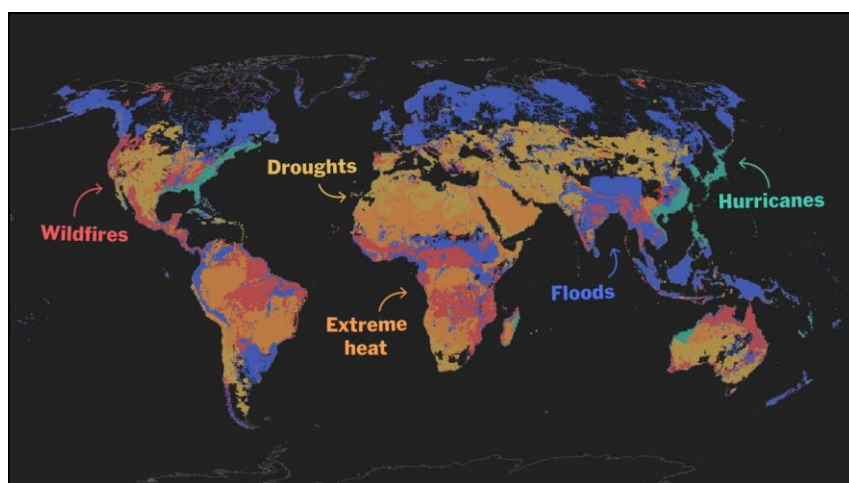


Source: Global Climate Risk Index (2022)

In Europe, hydrological events are the most damaging extreme weather events. In 2021, more than 196 people died in flash floods in Germany and Belgium. The average damage from hydrological events in Europe in the period 1980–2020 is estimated at US \$ 3.5 billion per year. It is predicted that the annual flood damage to the economy in Europe will increase up to 10-fold by 2050. In developing countries, on the other hand, most of the economic damage caused by extreme weather events occurs in the agricultural sector. The average annual economic damage from climate-related disasters to developing countries is estimated at \$ 24 billion over the period 1980–2020. Between 2005 and 2015, developing countries totaled \$ 96 billion in crop and livestock production losses due to natural disasters, 78% of which were caused by drought, floods, and other weather events.

By 2040, the number of people exposed to devastating floods is projected to increase from 2.2 billion to 3.6 billion, or from 28% to 41% of the world's population. Areas that makeup \$ 78 trillion, or about 57% of today's global GDP, will be vulnerable to flooding. More than 25% of the world's population in 2040 may be in areas where the frequency and severity of hot days far exceed local historical extremes, with negative impacts on human health, labor productivity, and agriculture. In some areas of Latin America, climate change will expose 80–100% of agriculture to increased heat stress in 2040. Moreover, it is estimated that by 2040 more than a third of today's agricultural area will be at risk of severe water stress. Over 125 million people and over 35 million hectares of agricultural land in Africa will face increased water scarcity, threatening regional food security. By 2040, almost a third of the world's population could live in areas where meteorological conditions and the availability of vegetative fuel would allow fires to spread if ignited. More than half of the population in the most vulnerable small island developing States are exposed to cyclones or coastal flooding exacerbated by sea level rise. In the United States and China alone, areas with more than \$ 10 trillion in GDP (PPP) are prone to hurricanes and typhoons [1].

Figure 2. Main weather risk factors in the world



Source: Serkez, (2021)

Therefore, the effective management of the risk of extreme weather phenomena is one of the greatest development challenges in the modern world economy. This publication is an overview, and its purpose is to indicate the possibility of protection against the risk of extreme weather events by transferring this risk to the financial market. The work uses a research method based on interdisciplinary literature studies in the field of finance, economic geography, and management. The literature review process consisted of several successive stages. The first step of the research was to formulate the research problem, collect and evaluate relevant data, analyze and interpret the collected data, present the data and present the directions for further research. In this article, a narrative review of the scientific literature was carried out to identify the available financial instruments hedging against weather risk and to present the main advantages and disadvantages of these instruments in the conditions of dynamic climate change.

At the stage of formulating the research problem, the criteria for the selection of publications included in the literature review were also defined. The idea was to use the latest possible publications on the risk of weather and weather financial instruments. Moreover, special emphasis was placed on the analysis of the rich literature on the subject.

The analysis results show that in practice there are many tools to protect against the risk of extreme weather events, which is transferred to the financial market. These instruments include weather bonds, weather insurance, and weather derivatives. All these instruments have their advantages as well as disadvantages. Hence, it can be concluded that there is no ideal, universal instrument thanks to which the weather risk is transferred to the financial market, which would be appropriate in every situation, because the possibilities of effective use of these instruments in practice depend on many factors, such as the scale of extreme weather phenomena, the level of economic development of a given country, knowledge and experience of entities hedging against weather risk, etc. [2].

The essence and types of risk

The term "risk" comes from Italian, where *risk (i)* means the reef that the ship should avoid. The risk comes from making various decisions about the future [3]. In practice, none of the company's activities are risk-free [4].

In economics, attempts are made to define the concept of risk in the context of Knight's theory of uncertainty and risk. This approach distinguishes between measurable uncertainty, called risk, and non-measurable uncertainty, simply called uncertainty. The measurable uncertainty occurs when the result of a given activity can be measured using a mathematical, statistical, or estimated probability. Conversely, when the result of an activity cannot be measured with one of the measures listed above, there is uncertainty. At the same time, risk must be distinguished from hazard. A threat is a condition, event, or circumstance that has the potential to harm people or cause financial loss. On the other hand, the risk is a potential result of a hazard occurrence, generally defined as the probability of the occurrence of harm and its severity.

In the literature on the subject, the risk is often identified with something unfavorable, a specific threat increasing the operating costs of a given entity. Thus, in this case, the risk can be defined as “the probability of incurring losses due to various events (threats). In this case, it is referred to as the so-called pure *risk*, which is mainly dealt with by insurance companies. As an example of such a risk, one can indicate such risks as the risk of fire, theft, flood, etc. The purpose of pure risk management is therefore to reduce the probability of adverse effects of the analyzed events.

Risk can also be defined on a neutral basis, as the probability of incurring losses or earning income higher than expected as a result of various events. In this case, both the negative and the positive aspects of risk are taken into account. Hence the so-called speculative *risk*. An example of such a risk may be the price risk, sometimes also known as the market risk, such as the risk of interest rate, exchange rate, or the risk of changes in the price of shares in the market. The purpose of speculative risk management is to increase the probability of the occurrence of positive effects of a given phenomenon and to reduce the probability of negative effects of a given phenomenon.

According to the above-mentioned risk division criterion, the risk of extreme weather events (often colloquially called weather risk) means the exposure of a given entity (enterprise or household) to extreme fluctuations in weather factors, such as air temperature, rainfall, and snowfall levels, wind forces, etc. . . , and thus is an example of pure risk, the realization of which is associated only with losses for entities affected by these phenomena.

The propensity to accept risk, often colloquially called risk appetite, is of fundamental importance in the risk management process. Both in the literature on the subject and in economic practice, there is no uniform definition of this concept. Based on many different definitions of the aforementioned concept, risk appetite can be defined as the level of risk resulting from the willingness of a given entity to take it. At the same time, it should be emphasized that in practice it is not possible to determine for all organizations or for a specific entity one common level of willingness to accept risk for all risks associated with the activity. Hence, it is possible to indicate such entities that protect themselves against almost all types of risk, or against some risks, or which do not protect themselves against risk at all. Moreover, it should be noted that in practice it is not possible to eliminate the risk, it is only possible to minimize it. The risk that remains is called residual. Most often, further risk minimization is unjustified from an economic point of view [5]. Therefore, risk management is the process of making decisions and implementing actions leading to the achievement of an acceptable level of risk by a given entity.

Risk of extreme weather phenomena

According to the European *Organization for the Exploitation of Meteorological Satellites (EUMETSAT)*, more than a third of the European Union's economy is sensitive to weather conditions [6]. According to research by the National Oceanic and Atmospheric Administration (*NOAA*), approximately \$ 5.7 trillion out of \$ 15.7 trillion of GDP in the US is sensitive to changing weather conditions [7]. This means that a large part of the demand for European and

American products is related to weather variables such as air temperature, rainfall, snowfall, wind force, and solar levels.

The risk of extreme weather events, therefore, relates to losses in the level of production or production capacity resulting from extreme weather events, such as rainfall, snowfall, winds, or temperature. A characteristic feature of these phenomena is their variability, which makes them similar to classic types of risk. Hence, the course of atmospheric phenomena can be described using the normal distribution [8]. According to Barrieu and Scaillet, weather risk can be defined as "risk that is part of everyday life, has limited economic consequences daily, but with enormous potential consequences if it accumulates or repeats" [9]. On the other hand, according to the definition provided by Clemmons, weather risk is equated with the exposure of the company's operations to fluctuations in weather factors, such as temperature (heat and frost), rainfall and snowfall, wind force, etc. [10].

Weather risk can be divided into two main types. It is about non-catastrophic risk and catastrophic risk. Non-catastrophic weather risk is the probability of loss as a result of weather conditions deviating from their average, normal condition. It usually manifests itself in the form of above-average or insufficient rainfall, snowfall, above-average or below-average air temperature, or more windy or windless days. These types of weather phenomena may occur with varying degrees of strength in different regions of the world. In turn, the catastrophic risk is the probability of suffering losses as a result of such phenomena as earthquakes, hurricanes, tornados, floods, torrential rain, hailstorms, snowstorms, and extremely high temperatures. Contrary to the non-catastrophic risk, the scale of deviations occurring here is more important [11]. Weather variables increase the volatility of the financial results of various industries, in particular, such as the energy, transport, construction, agriculture, tourism, and food industries.

Table 1. Hazard and weather risks in various sectors of the economy

Sector	Weather threat	Effects of weather risk
Energy sector	Temperature	Lower sales during warmer winters and cooler summers
Agriculture, food sector	Temperature, snowfall, rainfall	Losses or lower gains in periods of extremely low/high temperatures or rainfall, snowfall
Beverage sector	Temperature	Lower sales during colder summers
Construction	Temperature, snowfall	Delays in works during bad weather conditions
Transport and logistics	Temperature, snowfall, rainfall	Delays in deliveries during bad weather conditions
Tourism	Temperature, rainfall, snowfall	Losses or lower gains in periods of extremely low/high temperatures or rainfall, snowfall

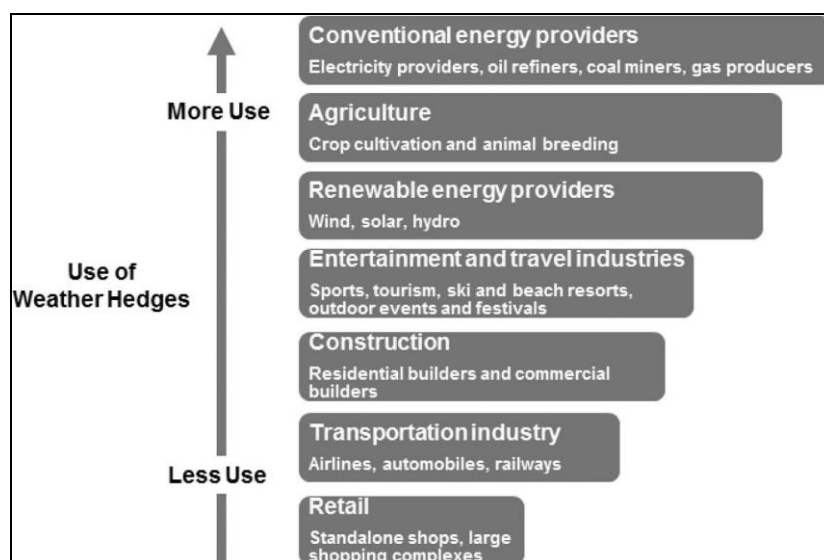
Public sector	Snowfall	The greater cost of clearing snow during heavy snowfall
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Source; Own study based on Dordević (2018)

All companies operating in the sectors mentioned above are most vulnerable to weather hazards that can have a severe impact on their cash flow and profits. The most significant weather hazards include rainfall, snowfall, and unfavorable air temperature. Moreover, it is known that the weather directly or indirectly affects the revenues of up to 75% of operating enterprises.

Of course, entities operating in individual sectors of the economy protect themselves against weather risk to a different extent by transferring this risk to other entities. Enterprises from the energy sector are most prone to hedging against the risk of extreme weather phenomena, while entities operating in retail trade are the lowest.

Figure 3. The propensity of enterprises to transfer weather risk by sector of activity



Source: Bodilya and Colemanb (2021)

Possibilities of transferring weather risk

Weather (climate) risk can be reduced through a variety of activities, including:

risk avoidance, i.e. the use of an active risk management strategy, which includes the use of prognostic (decision-making) information to optimize operational processes in a way that will reduce or eliminate exposure to weather conditions;

optimal risk retention (retention), i.e. the use of in-depth knowledge of the weather system to develop balancing or negatively correlated actions contributing to increased resistance to weather conditions;

risk transfer, i.e. hedging of a parametric weather index, using weather bonds, traditional insurance products, or financial derivatives [12].

A catastrophe bond (CAT) is a high-yield debt instrument that is designed to raise funds by insurance companies in the event of a natural disaster. A catastrophe bond allows the issuer to receive funding from the bond only when certain conditions occur, such as an earthquake or a tornado. If the event protected by the bond activates the payment to the insurance company, the obligation to pay interest and repay the principal to investors is postponed or completely waived. CAT bonds have short maturities of three to five years. The main investors in these securities are hedge funds, pension funds, and other institutional investors.

For example, in January 2004, a 5-year catastrophe bond was issued by a special purpose entity to transfer to the bondholders the risk of hurricane damage in Electricité de France's electricity transmission and distribution system. The bond uses a specially constructed indicator that not only takes into account the recorded wind speeds in the area covered by the transmission and distribution system but also reflects the system's susceptibility to wind damage. When the measured index passes the trigger point, payments are made to EDF whether or not physical damage has occurred.

The concept of weather bonds is similar to the catastrophe bonds that have been used periodically since 1997 by reinsurers to transfer the risk of catastrophic events such as earthquakes and hurricanes. When weather bonds are issued, the proceeds from the sale are deposited in the account of the special purpose entity. Bondholders receive interest and principal from the premiums due to the reinsurer. Again, bondholders lose all or part of their interest and principal payments in the event of an insured extreme weather event.

As in the case of catastrophe bonds, weather bonds can be used to transfer to the bondholders the weather risk of having a basket of weather derivatives in front of the entity. The first and so far only weather bond was issued in 1999 when Koch Energy Trading worked with insurer Goldman Sachs to create a 3-year \$ 50 million offering that transferred to investors the risk of a portfolio of 28 air temperature weather derivatives in 19 different US cities. The securities were offered by Cayman, Kelvin Ltd. In this context, should the weather derivatives fall in value, the special purpose issuer would be required to make a payment to Koch Energy Trading by the terms of the contract.

The Inter-American Development Bank is also gearing up to launch a \$ 300 million weather-dependent bond offering that will transfer a portfolio of weather derivatives owned by Entergy-Koch Trading to equity markets. The coupons will be tied to the performance of a wide range of global weather threats, from wind speed in Spain to snow depth in Fukushima, Japan. The bond issue will be divided into three tranches and will offer a guaranteed coupon in the first year. After that, the coupons will be linked to the weather index and may change over time. Investors' appetite for these securities can be a good indicator of whether weather bonds will have a good future.

Weather bonds have many advantages, but also have disadvantages scrolls. The main benefits of using these instruments include the possibility for investors to achieve stable and relatively high income (interest) throughout the life of the bond. Weather bonds can also help to hedge your asset portfolio against other types of risk that are not correlated with price movements in the stock exchange. On the other hand, the main disadvantages of using these instruments include the relatively high risk of the investor losing the principal amount invested if the payment is made to the bond issuer. Moreover, short maturities of weather bonds may not reduce the probability of the initiating event occurring if the frequency of weather events increases.

In practice, insurance against extreme weather phenomena consists in transferring the potential effects of weather risk to the insurance company in return for a fee (insurance premium), which is each time calculated by the insurance company depending on the circumstances. When an extreme event occurs, policyholders must provide evidence of the damage they have suffered to claim funds from the insurance company, which is a common feature of indemnity insurance. In many countries, some types of weather insurance are mandatory. For example, flood insurance is compulsory in some OECD countries but voluntary in others. The extent to which insurance premiums reflect the local level of risk also varies by country and by insurance product. In addition to helping policyholders to recover claims after damage, extreme weather insurance also plays an important role in reducing total expected damage by financially supporting and encouraging preventive measures. For example, insurance companies cover risk-reducing improvements when repairing damaged homes. They also provide premium discounts if policyholders take technical measures to reduce the risk of flooding or settle in relatively safe areas [13].

Compensation-based insurance, in which payouts are determined by on-site loss verification, has not only failed in most developing countries but also most developed countries. Therefore, a new insurance product against extreme weather events has emerged in the form of index-based insurance (index insurance). In index insurance, also known as parametric insurance, payouts to policyholders depend on an index that correlates strongly with losses in income or assets. Existing index insurance schemes use data such as rainfall intensity, average yields, and livestock mortality to construct the index. The index is computed at an aggregated geographic level, such as a region or a county. Policyholders receive insurance payouts each time the index exceeds or falls short of a predetermined threshold, regardless of whether the policyholder has suffered a loss or not. As individual damage verification is not performed on index insurance, transaction costs are significantly lower compared to indemnity-based insurance, potentially making index insurance more affordable. In addition, index insurance avoids moral hazards as policyholders with below-average losses continue to benefit from payouts when the threshold

is reached at an aggregated geographic level. The main challenge in index insurance is the underlying risk (i.e. the risk that the policyholder will suffer a loss but the insurance will not provide payouts or that the insurance will pay even though there is no loss). Therefore, it is important to identify an appropriate indicator that is strongly correlated with the damage while still relying on reliable data that is available with a slight time delay [14].

Weather derivatives are transactions where payments are made from one party to the other based on weather-related measurements such as air temperature, rainfall, snowfall, or wind speed. Companies that are exposed to the risk of changing weather can use weather derivatives to protect themselves against losses resulting from weather changes. Thanks to these instruments, enterprises can hedge against the risk generally related to the changeability of weather conditions. However, it should be clearly emphasized that weather derivatives offer the possibility of hedging against non-catastrophic weather risks.

Weather derivatives are typically structured as swaps, futures, and options based on different underlying weather indices. The most commonly used base instruments (indicators) are air temperature, precipitation, rainfall, snowfall, and wind [15].

While weather derivatives have many features in common with traditional commodity derivatives, there are several notable differences between the contracts. First, commodity derivatives are mainly used to hedge against price risk (related to the movement of commodity prices), while weather derivatives are usually used to hedge against strictly quantitative risks. Second, commodity derivatives may sometimes require the physical delivery of the underlying commodity (e.g. gas, oil, etc.) at a predetermined price and date. On the other hand, weather derivatives are never associated with the physical delivery of the underlying instrument (e.g. air temperature) and are always settled financially. Third, while in the case of commodity derivatives, there are also speculators in the market who seek to profit from future commodity price movements, weather derivatives are mainly used to hedge against risk and not to speculate.

There are five essential components to any weather contract:

base weather indicator;

the period over which an index accumulates (typically a season or a month);

weather station that reports daily maximum and minimum weather indicators;

the currency value attributed to each movement of the weather indicator;

reference value, the so-called strike price of the underlying index.

Analogous to traditional derivatives, weather derivatives come in two different forms, i.e. over-the-counter contracts and exchange contracts. By far the most common type of weather derivative is the air temperature derivative. They account for approximately 85% of all transactions in the weather derivatives market. Such contracts are typically based on the number of *heating degree days (HDD)* or *cooling degree days (CDD)* during the contract period (usually one month or winter or summer season) at a specific location. The number of HDDs or CDDs in any given period is a measure of the amount by which the average air temperature daily during that period deviates from 65 degrees Fahrenheit (18 degrees Celsius).

It is worth mentioning at this point that the temperature of 18 degrees Celsius is considered to be an arbitrary boundary between the period in which air conditioners are used and the heating period. On the other hand, the average air temperature is 50% of the sum of the highest and lowest temperature during the day.

In Europe, as an alternative to HDD and CDD, the CAT index (*cumulative average temperature*) is used, i.e. an index representing the average daily air temperature. Cumulative average temperature (CAT) contracts are available during the summer months in Europe, allowing companies to hedge against monthly volatility by tracking the city's average daily temperature.

Weather derivatives appeared in the late 1990s to help electricity producers protect themselves from adverse weather conditions. The first such contract was signed in July 1996, when the now-defunct Aquila Energy established security on two goods for New York's consolidated Edison company in connection with electricity demand. In 1999, the Chicago Mercantile Exchange launched the first exchange-traded HDD and CDD derivatives on a monthly or seasonal basis for certain areas. This exchange offers both futures and futures options. The Chicago Mercantile Exchange arranges trading for over 60 different contracts, including rainfall, snowfall, and air temperature options and futures, becoming the world's largest exchange for weather derivatives. Floating exchange rate derivatives based on air temperature are also offered on the London International Futures Exchange.

In turn, over-the-counter (OTC) weather contracts can be created for each weather variable because each such contract is bilaterally agreed upon and negotiated. Wind-based weather derivatives have recently become available on the over-the-counter market, allowing wind farm owners to hedge against the risk of light winds. These contracts are negotiated bilateral contracts that take into account both wind speed and the power generation characteristics of wind turbines. Entergy -Koch Trading has developed its wind energy indicators for selected locations in the USA and Europe. The index for each location is designed to reflect the amount of energy that could be generated at that location, based on both wind speed data and a power generation curve that reflects a basket of typical turbines. Because the amount of energy generated by a wind turbine is not linearly proportional to wind speed, wind force indicators are not simply wind speed. The wind power index for each location is calibrated such that the index for each location will be 100 during a normal year. A wind farm with some debt servicing obligations may therefore enter into a contract that would generate sufficient funds to repay the debt service in any contract period where the wind index would fall below 90.

About 10% of transactions in the weather derivatives market are contracts related to rain. Typically, these contracts (CPDs) are based on the number of rain days that occur during the contract period. In practice, this is about the number of days with rainfall above a certain reference level. Rainfall-based weather derivatives can be used to hedge the risks associated with hydropower generation. For example, a hydropower company may have a contract that will pay a certain amount if local rainfall is below the historical average.

Settlement of weather derivatives is always done in cash, unlike many other derivatives where counterparties can physically deliver the underlying commodities or securities upon expiry of the contract. The contract cash settlement value is calculated from the final HDD, CDD, rainfall, snowfall, or hurricane ratio multiplied by the specified price. Privately negotiated

weather derivatives are usually based on standards set by the International Swaps and Derivatives Association.

Advantages and disadvantages of weather-related financial instruments

Since weather securities (bonds and derivatives) are often based on a weather index, the advantages and disadvantages are comparable to those inherent in index insurance. Weather-proof securities reduce the moral hazard problem but come with underlying risks. Unlike index insurance, securities are tradable, which can lead to additional positive or negative effects. On the other hand, issuing and selling securities to obtain financial resources (securitization) increases the entity's liquidity and market liquidity. In addition, securitization facilitates access to a wider range of risk takers, such as banks or companies, with different risk profiles. For example, different sectors may be exposed to the opposite risks of the weather: while a dry and very sunny summer can hurt agriculture, it can have a positive impact on the beverage industry and solar energy producers. As a result, these sectors could take opposite positions in the weather-related financial instruments market. On the other hand, using weather securities requires more financial knowledge. In addition, securitization can make the market less transparent as it is not always clear who is currently bearing the weather risk.

Weather derivatives are considered derivative financial instruments. However, with the further increase in the number and variety of weather derivatives, the line between capital market products and insurance products is blurring. According to some economists, derivative weather conditions are insurance products and should be regulated by insurance. They argue that the companies involved in assuming the risk for a fee are known as insurers and that the fee paid by the entity wishing to transfer the risk is called the insurance premium. Regulation of weather derivatives would protect consumers against unfair contract terms and would ensure the maintenance of adequate insurance reserves.

On the other hand, as argued by others, weather derivatives are not insurance, because, unlike insurance, weather derivatives do not require the party to incur a loss to receive payment. Weather derivatives are simply contracts with contingent payment obligations.

There are at least a few positive aspects of using weather derivatives to hedge against weather risk. This includes, among other things, a transparent structure of weather derivatives, a low risk of default in the case of exchange contracts, or the possibility of flexible adaptation of the structure tailored to the needs of a given entity in the case of over-the-counter instruments. An important advantage of these instruments is also the fact that the amount of payments received is adequate for the losses incurred, there is no need to document the damage incurred to obtain the payment and it is possible to conclude a hedging contract for a short period.

On the other hand, the use of weather derivatives also has negative consequences. In this case, it is about the relatively high cost of using weather derivatives, the high cost of acquiring atmospheric data, the problem with a reliable valuation of the weather phenomenon and the associated risk, the lack of a commonly accepted model for the valuation of weather derivatives and, finally, the risk of a speculative bubble on the market as a result of leverage financial.

Concluding remarks

Weather risk management, by transferring the risk of adverse weather conditions to another party (usually an insurance company), has experienced a significant increase in the last 10-15 years. However, while climate change represents a major development opportunity for the insurance industry, it can also easily lead to the bankruptcy of many insurance institutions in extreme cases. Compared to the scale of concluded weather insurance, the remaining weather financial instruments (weather bonds and weather derivatives) still enjoy relatively less interest. This situation results from limited financial knowledge and little or even no experience in the financial market among entities exposed to weather risk. In particular, it concerns small enterprises, farms, or natural persons. Therefore, insurance is still the dominant form of weather risk transfer.

The effectiveness of transferring the risk of extreme weather events to the financial market depends on the correlation with other types of risk in the financial market, as well as the financial market's ability to bear this risk itself. On the one hand, there is a risk that the weather risk will end up with investors who are unable to cover their financial losses in the event of extreme weather events. On the other hand, there is a potential danger that an extreme weather event could even harm the stability of the financial markets.

To sum up, despite the existing possibilities of transferring the risk of extreme weather phenomena to the financial market, entities exposed to such risks are reluctant to use those opportunities that allow for effective protection against the risk of climate change. This situation is conditioned by many internal factors (e.g. lack of knowledge and experience of enterprises in the financial market) and external factors (e.g. lack of favorable legal or tax regulations). Moreover, it should not be forgotten that the transfer of weather risk to the financial market is only one of the available methods of hedging against this risk allocation. Moreover, state policy should aim at limiting the causes, rather than the effects, of the risk of extreme weather events. Therefore, the greatest role should be played by prevention, i.e. risk prevention, not eliminating the effects of weather risk.

First of all, economically less developed countries are characterized by relatively underdeveloped infrastructure and insufficient preventive policy. These countries are not only the most vulnerable to the immediate consequences of the risk of extreme weather events but also the least capable of mitigating and recovering from threats. Therefore, the transfer of risk to the financial market can play an important role in protecting these countries from climate change. Such risk transfer mechanisms contribute to limiting the negative effects of extreme weather events directly caused by the catastrophe. In addition, they can provide additional incentives to strengthen resilience before the disaster and to faster local learning and competence building. Moreover, risk transfer promotes investment as it reduces uncertainty. Such investments can be used to build or expand the immune infrastructure or to create the so-called "Green cities", and thus can contribute to the reduction of greenhouse gas emissions, which mitigates the process of climate change and the frequency and intensity of extreme weather events [16].

The results of the conducted research may constitute a starting point for further, in-depth research on the possibility of constructing new tools for the transfer of weather risk to the financial market and the positive and negative consequences associated with these tools for both individual entities and the entire economy.

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Change management methods within the implementation of a digital tool for construction waste management. EcoProekt EOOD case study

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Abstract

Today's dynamic business environment requires organizations to take increasingly flexible and innovative approaches in order to remain competitive and respond to market needs. Digital transformation of businesses is a prerequisite for them to survive and be competitive. This is equally important for rather conservative industries, such as the construction one and especially the construction waste management process. Traditional organizations which operate in this industry remain resilient to change, as they are typically used to outdated processes and procedures and rarely realize the need for a change. To ensure smooth process and successful digital transformation, it is imperative that organizations develop strategies and change management plans to support the digitalization throughout all key units. This paper makes a review of the recommended change management methods in a project-based environment and presents a case study of a particular company, which undertakes the initiative to introduce a digital tool to optimize its construction waste management activities.

Keywords: Change Management, Construction Waste, Digital Transformation

Jel Code: Y4

Introduction

In a world where business dynamics demand speed, perfection and accuracy, management systems are an important component in any company. Business management is a complex process that, to be successful, must follow the trends of new technologies and models. Integrated management systems are key to both supply, transaction and customer and order management. In the context of the construction sector and in connection with the growing need for more and more effective management of construction waste generated during the execution of construction activities, the digitization of these processes is given an increasingly high priority from a management point of view.

The topicality of the topic stems from the need for business organizations to follow the pace of modernization and digitization of their operational processes and activities.

The subject of research of the present development is the systems for integrated business management and in particular the systems for the management of construction waste as a side activity, and the subject of research is the management of changes related to their implementation, as well as their influence and direct benefits on the operational activity to the employees.

The main goal of the development is to present a model for successful management of changes related to the implementation of a new system in a business organization.

The main hypothesis is that EcoProekt Ltd. uses a construction waste management system, and this leads to changes in the organizational structure, as well as in the operative work of the employees and their efficiency. A survey was prepared to determine the degree of satisfaction among employees with the integrated management system.

Literature review

Basic concepts and advantages of integrated management systems

Management is an active process. It is not just a passive contemplation of reality, but an active intervention (intervention) of the subject of management in the normal functioning and development of the object. Therefore, management relates to changes, with new directions of development, with conducting an effective organizational policy. It is a non-stop renewal process of bringing the organization from one state to a new, better, more efficient development. With its active intervention, the subject of management changes the natural course of events.

The first five principles outline the guidelines for the activities of managers in the functioning of organizations as a single whole, and the following serve as a guide when building the organizational structure and relationships with staff:

Correct goal orientation - to direct the efforts of people and resources of the organization and its divisions to achieve clearly formulated, acceptable to customers and staff goals in any given period.

Full use of resources (economy, efficiency) - to achieve full use of all durable, personnel, financial, material, and informational resources of the organization over time.

Creating and extracting new value requires that the market-determined value of the products created in the organization is significantly higher than the value of the material and financial resources invested in them.

Distinctive skill (competency) – to have a clear understanding of the processes, resources, or products of the organization with which it actually or potentially surpasses competitors and

turn them into lasting competitive advantages by directing resources to their development and drawing customers' attention to their importance.

Entrepreneurship (reasonable risk) – to discover and use new opportunities provided by the environment and internal reserves of the organization, accepting the inevitable risk of any innovation.

Correspondence between the strategy and the structure of the organization - to determine the signs of construction and the parameters of the organizational structure depending on the adopted general strategy and, if necessary, make the necessary changes in the structure.

Correspondence of rights (power) and responsibilities – depending on the assigned responsibilities (goals, evaluation indicators, etc.) to each unit or position in the structure, sufficient rights and resources should be provided that make their implementation possible.

Management as just power – requires such behavior towards staff that presents it both as a structure with great capabilities (power) and as the embodiment of justice. [1]

An organizational process management system is a specific type of system that, from a cybernetic point of view, is a set of objects and subjects that function as a single entity to achieve a predetermined goal.

The integration of the information system into an existing organizational structure is a complex task that depends both on the flexibility of the system and the possibility of easy adjustment, as well as on the capabilities, desire, attitude, and training of employees to accept and use modern information technologies. The effective implementation and use of information systems in management goes through the selection of appropriate technological solutions, good organization of their integration into the existing structure and training of personnel (employees and, to a greater extent, managers) who will serve and use it in their work. [3] In other words, the theoretical statements confirm the opinion of the experts from BG Business Solutions Ltd. (2016) – an official SAP PartnerEdge program partner, that an integrated business management system: “covers all processes and departments in an organization, automating the activities of managing finance and accounting, trading, production, human resources, and the organization's relationships with its customers and partners.”

In this regard, the benefits for an organization that integrates an appropriate information system into its management processes can be (Business Solutions Ltd., 2016):

Implementation of the best practices embedded in the software

Unification of internal company procedures and ways of working, which helps to improve the working environment and customer service

Avoiding duplication and double entry of information

Improving the management of stock and company assets

Supporting the development of the company and increasing its flexibility

Increasing revenue through the ability to generate heterogeneous analyses, which help to respond quickly and adequately to changes in the market environment

Improving cooperation between departments in the company

Unified database

Functional comprehensiveness

Maximum flexibility as an opportunity to react to changes

Full and immediate usability of all data

Full information connectivity of all users

This is also confirmed by the specialists of TechnoLogica (2013), who believe that:

Integrated business solutions are the only choice for imposing a unified and consistent vision, mission and strategy in all units and branches of the organization. They provide the kind of global visibility into processes, spanning organizational and territorial boundaries, that employees need to achieve better results, as well as senior management to be able to make profitable investments and make successful decisions.

The database maintained in the integrated management system is uniform for all system applications with very precise access rights at different levels – product, product category, warehouse, department, location, position, organization, etc.

Maintaining up-to-date and versatile information in the system creates prerequisites for accurate measurement and analysis of all elements of the cost of products.

The well-developed system supports a rich set of references and extremely flexible tools for defining and generating a variety of reports. Numerous tools for analysis and evaluation allow daily monitoring of the achieved financial results and evaluation of the effect of the decisions made.

Change Management in Business Environment, Types of Change and Success Factors

Change Management is a structured approach to the change of individuals, groups, organizations, and companies that make possible the transition from a current structure to a desired future structure. Change management provides methods and means of recognizing and understanding change and the human impact on transition. [5]

The purpose of change management is to implement strategies to bring about change, control change, and help people adapt to change.

As stated in other sections of this definition, taking a structured approach to change management helps organizations streamline the process, reduce costs, reduce lead times, improve leadership skills, drive innovation, and improve motivation. [4]

In addition, several ways change management can help add structure to IT and operations are:

Improved documentation of corporate systems

Greater consistency between the proposed change and what is being implemented

A better starting point for automation initiatives

Understanding why the systems were created

Ability to reverse engineer changes made to existing business processes and infrastructure; and

Better ability to identify what can be safely eliminated or updated.

One of the first researchers in the field of innovation is J. Schumpeter, defined as the founder of the theory of innovation. It considers innovation as a novelty applied in the technology of production or in the management of a given economic unit. In this regard, an innovation has two important features: it is implemented in production, and it creates a benefit. The author considers that from the point of view of the construction sector and construction waste management, the introduction of digital systems to optimize these activities is an innovation, as it significantly improves processes and brings added value to the organizations that implement them. Change and innovation are closely interrelated. Every innovation is inherently a change. On the other hand, however, not all change means innovation.

Technological progress, producing new scientific knowledge and technical means, is the cause of significant changes in the life of any organization. The rate of technological innovation has increased severalfold for each decade for the past 100 years. [2]

There are two main types of forces that should be considered when implementing a particular change. External forces create the need to introduce change from several main sources. These include: political forces, the market environment, laws and regulations, technology, the labor market, economic changes, etc. Internal forces within the organization can also create the need to implement change. These forces originate mainly from within - organizational operations of functioning and from the direct impact of external forces. [2]

There is great diversity in the types of changes that exist. From an organizational perspective, the types of change initiatives can be:

Strategic Change: Refers to a change made in important features of an organization's business to mitigate new threats or take advantage of new market opportunities. This type of change affects the organization's strategy and various other components.

Structural change: Refers to a change in organizational hierarchy, management hierarchy, management systems, job structure or administrative procedures. A merger is the most common cause of structural change in an organization.

Technology- or process-oriented change: These types of organizational change are related to changes in the technology the business uses or the processes it follows. This could be the introduction of new software or a system. Organizations can redesign processes to streamline workflow and increase productivity.

People-centered change: Employees are the main agents of change, and they are involved in every step of the process. However, people-oriented processes refer to changes in employee skills or performance, or the process of hiring new employees.

Transformational change: Digital transformation has taken the world by storm and changed every aspect of our lives. The world of business has changed dramatically through the introduction of new and innovative technologies, processes, and frameworks. Transformational change is a combination of all the above changes introduced to change the fundamental elements of an organization, including culture, values, and operations. [6]

The introduction of a construction waste management system in a construction design organization can be characterized as a technology- and process-oriented change. Technology- or process-driven change refers to the way an organization manages its operations, technologies, and processes, develops its products, or delivers its services. Digital transformation and innovation are rapidly changing the business landscape and organizations are finding new ways to improve their business processes by using new technologies and frameworks. This has dramatically increased the need for technology-driven change.

This type of change is accompanied by training to help employees adjust to the new technology or process. Enterprises use digital adoption platforms (DAPs) to accelerate the adoption of new technologies or processes during a change process.

A change management model for the implementation of an electronic construction waste management system in the design organization EcoProekt EOOD

EcoProekt EOOD is a building design and construction company that operates on the Bulgarian and foreign markets, works on projects of all sizes. The company's experience includes complex construction of residential, public, and industrial buildings, hotels, and commercial establishments.

In connection with the increasingly intensified work on international projects, as well as the participation in projects in the public sector in the country, the company deals more actively with the "Waste Management" part, which requires the training of more specialists in this field. In addition, these factors require the increasingly active use of recycled building materials in the buildings designed by EcoProekt EOOD. For these reasons, the management of EcoProekt EOOD decided to introduce a digital system for the management of construction waste to

reengineer and optimize the existing business processes in this regard. The expectation is that this will minimize the possibility of human error, increase the productivity of teams by enabling many employees to work simultaneously on a single project in a digital environment, improve accountability and give access to an up-to-date database of manufacturers of recycled building materials.

Before starting the project to implement the new system, the team responsible for this prepares a SWOT analysis of the factors of change in the organization when implementing a construction waste management system. The results of the SWOT analysis are presented in table 1:

Table 1: SWOT analyses of the factors of change in EcoProekt EOOD

<p>Strengths (EcoProekt EOOD):</p> <p>Accessible language and interface, quick learning</p> <p>Systematized documentation, creation and archiving of important documents</p> <p>Broad applicability and adaptability for any projects/scenarios</p> <p>Reduction of costs related to the calculation of estimated amounts of construction waste</p>	<p>Weaknesses (EcoProekt EOOD):</p> <p>An initial financial investment is needed for both the digital system and staff training</p> <p>Lack of integration with existing design systems, requiring manual data transfer</p>
<p>Opportunities (EcoProekt EOOD):</p> <p>Lack of competition in Bulgaria (few companies use similar systems)</p> <p>Facilitating the work of both the company's project teams and the administrations they work with</p> <p>Improving communication between the various participants in the process</p> <p>Proven effectiveness of similar digital solutions in other European countries</p>	<p>Threats (EcoProekt EOOD):</p> <p>Lack of legal regulations to regulate the introduction of such an instrument in practice</p> <p>Lack of qualified employees and the necessary skills to handle the system</p> <p>Presumed reluctance or mistrust on the part of process participants towards innovative and digital solutions, resistance on the part of employees when introducing the system</p>

Can be easily incorporated into the training of new staff	
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Source: Own data

Based on the results of the analysis, as well as the company's previous experience related to the implementation of innovations and improvements in existing processes, the management considers that the greatest threat is the perceived reluctance and resistance of employees to the introduction of the new system. In general, such types of innovative and digital solutions have often encountered resistance from professionals in their field, who are used to working in traditional and proven ways and do not themselves realize the need for innovation and change.

In his book "Management of Change", John Kotter presents to us, as close as possible to modern realities, a model for managing change - an eight-step model for managing change. He points out eight main levels (steps), namely (Kotter, 1996):

1. Creation of a state of emergency
2. Formation of a supporting team
3. Clear formulation of the idea of change
4. Implementation of explanatory communication
5. Empowering change support staff
6. Accomplishing short-term "wins"
7. Consolidation of completed stages
8. Ensuring continuity in the direction of the achieved changes.

Implementing the "eight-step" change management model is especially relevant when working in a project setting. It is aimed at securing and attracting employees. Its clearly defined stages are relatively easy to implement and follow. Its ability to quickly compile to established structured hierarchy systems makes it even easier to implement.

Following John Kotter's model, the project team identifies in which of the eight steps their plan has gaps that could result in a failed implementation of the system. The following units for improvement have been identified:

Implementation of explanatory communication: Initially, the team plans to communicate the progress of the project to implement an electronic construction waste management system with the employees on a monthly basis. After studying Connor's recommendations in more detail

(e.g., for management to communicate the vision for change frequently, to communicate with people openly and honestly, answering all their questions, concerns, or fears related to the change, to lead by example by implementing the vision, and the strategies to all aspects of his work, as well as to the work of the units for which they are responsible), the project managers change the communication strategy to more frequent and open communication by sending email correspondence about the progress and status of the project on a weekly basis, and organize hour-long meetings at the end of each week devoted to questions and answers about the project and upcoming changes, in which employees can choose to participate in.

Empowering employees supporting the change: In order to get more employees on their side, the project management decided to conduct regular semi-structured interviews and questionnaires with all employees whose work is expected to be affected/changed by the introduction of the new system. The expectation is that in this way, not only will the understanding of the users' needs regarding the functionalities of the system be improved, but it will be possible to identify at an early stage the risks associated with uncertainty caused by changing the established work processes and, accordingly, the resulting reluctance for cooperation during the implementation and subsequent use of the new system.

In connection with the improvement of the project plan in the phase "Empowering employees supporting the change", the project team develops a questionnaire that is sent to all employees who will be directly or indirectly affected by the implementation of the construction waste management system. For the purposes of this paper, only three of the questions are presented:

Do you think that the introduction of an electronic construction waste management system will lead to a more precise calculation of the estimated amounts of waste at the design stage?

This question was preceded by a series of other questions aimed at finding out how accurately, according to the officials (designers), the amounts of construction waste are determined at the design stage. Most designers consider that the current accuracy of determining the estimated quantities is not accurate enough, especially for the needs of foreign projects and those under public procurement, where the requirements are significantly higher. In sync with this, to this question they also give a significantly large percentage of answers in favor of the expectation that the digitization of this manual calculation process through an electronic system will lead to a minimization of errors and, accordingly, to more precise and closer to the real ones (which are defined during project execution) values.

Do you think that the introduction of an electronic system for the management of construction waste will give a competitive advantage to the organization in which you work?

To this question, only one third of the employees answer positively, while the rest answer negatively or with an answer "not sure". Analyzing this and other issues related to the degree of familiarity of employees with existing digital systems for managing construction waste in competitive companies in the country and abroad shows that there is a need for additional training on the subject to clarify the benefits of these systems, discussing examples from

practice and clearly communicating the vision and business strategy behind the project implementation.

Having seen the prototype of the electronic construction waste management system that will be implemented, what do you think are its strengths and weaknesses? What would you change and what would you not change about the system?

o This question allows employees to give "open-ended" answers, which proves to be quite useful. A large proportion of interested employees (56%) provide detailed feedback on their expectations for the system and improvements they would like to see in specific functionalities, resulting in easier work with the system.

Conclusion

The digitization of business processes and operations is essential for the success of any organization in the modern business environment if it wants to remain competitive in the market. With the development of information technology, several business management systems have appeared that cover all its aspects. It may be that organizations of similar size, scope of activity and business processes would benefit from implementing completely different management systems. In the context of construction-investment design, electronic systems occupy increasingly central functions, and many organizations are turning to the implementation of management systems for their various business processes and operations, including construction waste.

The management of changes resulting from projects for the implementation of innovations, improvements and management systems in an organization is essential for the successful implementation of the project and the extraction of benefits for the organization and, respectively, for its employees. There are a number of change management models, one of the most common in project-based work being the "eight-step" model of J. Kotter. It has been proven in practice that if an organization adheres to the structure of Kotter's model, it will have at its disposal a reliable and proven change management system, creating a prerequisite for the success of important projects and strategic initiatives.

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Sharing Economy and Environmental Sustainability

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Abstract

Sharing economy consists of circular business model activities as a key component of sustainable consumption in a circular economy. The purpose of this paper is to examine the contribution of sharing economy on countries' environmental sustainability performance and whether its footprint is eco-friendly to society. To achieve the objective of our study, we utilize panel data regression on a sample of 44 selected countries. We use the Sharing Economy Index (SEI) as an independent variable, the Environmental Performance Index (EPI) as the dependent variable, and foreign direct investments (FDI), industrialization (IND), population density (POPD), urbanization (URB), education (EDU), and ISO14001 certification (ISO) as control variables. There is an ongoing debate on whether sharing economy contributes positively or negatively to the environment. Our results reveal a significant negative impact of sharing economy on environmental sustainability, which suggests that an increase in the sharing economy activities does not lead to better and more sustainable environmental performance. Even though studies in the past have focused on specific industries and countries, a cross-country analysis of the sharing economy would contribute to existing knowledge, given that its value added to the worldwide economy has increased significantly.

Keywords: Sharing economy, Circular business models, Environmental performance, Sustainability, Circular economy

Jel Code: E21, Q32, Q53, Q56

1. Introduction

The sharing economy, also known as the peer-to-peer economy or gig economy, refers to the growing trend of individuals and businesses sharing their resources, including physical assets such as cars, homes, and other items, with others for a fee. This type of economy is part of the larger concept of circular economy, which focuses on reducing waste and maximizing the use of resources.

The aim of this study is to examine the contribution of sharing economy on countries' environmental performance and to determine whether its overall impact is eco-friendly for society. This is a timely and important topic, as sharing economy business models have witnessed speedy growth in recent decades but have also faced criticism for their potential environmental impact.

The environmental sustainability of the sharing economy is a topic of debate. Some argue that it reduces waste and resource use, while others say it could increase carbon emissions and degrade the quality of shared goods. The potential rebound effect of increased consumption and the quality of shared goods are also factors to consider. This study aims to investigate these and other factors related to the environmental sustainability of the sharing economy.

2. Literature Review

Sharing Economy and Environment

The sharing economy has the potential to add \$335 billion to the global economy by 2025, according to a study by the Boston Consulting Group [3]. This growth is expected to come from increased efficiency and productivity, as well as the creation of new job opportunities. However, there are also concerns about the potential negative impacts of the sharing economy, such as job losses [5] and income inequality [7].

The sharing economy can have positive social and community-building impacts, such as facilitating connections between individuals and organizations and helping individuals learn new skills [2]. It can also have positive environmental impacts by enabling more efficient use of resources and reducing the need for individual ownership and consumption. However, a study by Davlembayeva [7] found that sharing economy platforms can only lead to a decrease in carbon emissions in certain cities and may not be applicable to all sharing economy platforms. Additionally, ride-sharing has the potential to reduce traffic congestion and carbon emissions [4].

The sharing economy can have positive environmental impacts by reducing the need for individual ownership and consumption and promoting sustainable practices. However, there are challenges such as a lack of regulations and standards for sharing economy platforms, leading to a lack of accountability for their environmental impacts. For instance, the increased use of ride-sharing services has led to more air pollution and greenhouse gas emissions [25]. Examples of sharing economy platforms with positive environmental impacts include Olio and Too Good To Go, which allow users to share excess food and reduce food waste, and Airbnb, which provides economic benefits to hosts and guests and supports local businesses [25].

However, on the other hand, the sharing economy can have negative impacts on the environment and labor standards. According to a study by the Danish Council of Ethics, the carbon footprint of an Airbnb rental can be up to three times higher than a traditional hotel room because Airbnb rentals often use more energy and water per guest. Airbnb has also contributed to over-tourism in certain cities, leading to a strain on local resources and increased pollution. In addition, the growth of the sharing economy has led to the exploitation of workers and the erosion of labor standards, such as the lack of benefits for gig economy contractors. This can result in increased use of cars and other forms of transportation, leading to more air pollution and greenhouse gas emissions. Despite the potential benefits of the sharing economy, there is still a lack of data on its environmental impact and the need to consider other factors that may influence environmental performance.

Foreign Direct Investments and Environment

Foreign direct investments (FDI) have been extensively studied for their potential benefits in terms of innovation, employment, and economic growth. However, there is still debate about whether FDI is good or bad for the environment. The potential effects of FDI on the environment are typically discussed under two theoretical hypotheses: the pollution haven hypothesis and the pollution halo hypothesis [12]. The pollution haven hypothesis posits that the transfer of industrial production from developed economies to developing ones is accompanied by increased pollution in the host country. The pollution halo hypothesis is based on the assumption that foreign investors are more environmentally friendly [8]. Regardless of whether the effect of FDI on the environment is positive or negative, it is a factor that must be considered.

Education and Environment

The general education level of a population is also thought to have an effect on environmental performance. Two main arguments are typically given in support of this idea. Firstly, a higher level of education is associated with better environmental awareness, which can lead to improved environmental productivity. Secondly, education can also affect how societies consume energy resources, which is a key factor in environmental sustainability. A number of studies have demonstrated that education has a positive effect on the environment in the long term [1], [10], [16], [22].

Industrialization and Environment

The literature indicates that industrialization has a negative impact on environmental quality. However, if industrialization is driven by technological innovation, it can improve

environmental performance [24]. Several studies have found that industrialization contributes to environmental degradation despite its positive effect on economic growth [14], [15]. Industrialization and rapid urbanization have a negative impact on the environment, particularly in terms of CO₂ emissions. The process of industrialization is a significant determinant of changes in environmental quality, and a small increase in the industry's share of total output is associated with a significant increase in emissions per capita [6]. Overall, scholars agree on the negative impact of industrialization on the environment.

Population Density – Environment

When studying environmental performance, it is important to consider also population density. Research suggests that there is a direct relationship between population density and environmental quality. For example, Ohlan [20] found that population density has a statistically significant negative impact on CO₂ emissions. Rahman [23] also found that population density has a negative effect on the environment. Han and Sun [13] found that population density is associated with higher concentrations of PM_{2.5}, which is harmful to human health. These studies provide evidence of the link between population density and environmental quality.

Urbanization and Environment

Urbanization has a significant impact on environmental quality. Ohwo and Abotutu [21] highlight some of the problems that urbanization causes for the environment, such as pollution, deforestation, erosion, and flooding. These problems can have negative effects on human health and other living organisms. Martínez-Zarzoso and Maruotti [18] studied the relationship between urbanization and CO₂ emissions in developing countries between 1975 and 2003. They found that there is an inverted U-shaped relationship between urbanization and CO₂ emissions in developing countries. This means that at low levels of urbanization, an increase in urbanization is associated with an increase in CO₂ emissions. However, at higher levels of urbanization, the impact on CO₂ emissions becomes negative. These studies suggest that urbanization can have negative effects on the environment and that its impact can vary depending on the level of urbanization.

ISO14001 certifications and Environment

ISO14001 is a standard that provides requirements for organizations to develop and implement an environmental management system (EMS) to improve their environmental performance and reduce negative impacts on the environment. Research has shown that ISO14001 certified firms tend to have better environmental performance than non-certified firms, for example in terms of emissions, waste generation, and water consumption [19]. ISO14001 certification can also help organizations to comply with environmental regulations and laws, and can improve their reputation and credibility in the market (Erauskin-Tolosa et al., 2020). Overall, ISO14001 certification can be a valuable tool for organizations looking to improve their environmental performance.

The aim of this study is to examine the impact of sharing economy on environmental performance. Based on the literature review, the following hypotheses are formulated:

H0: Sharing Economy has a positive impact on the Environment

H1: Sharing Economy does not have a positive impact on the Environment

3. Tools and methodology

Sample

The study sample consists of 44 countries for which data was available on all the variables involved. The sample of countries in this study is spread across several regions, including Asia (3 countries), Australia (1 country), Europe (33 countries), Europe/Asia (3 countries), North America (2 countries), and South America (2 countries). The study is limited to only two years, 2020 and 2021, due to the limited data available. This results in 88 country-year observations for each variable.

Variables

Table 1 presents the variables used in the study, their description, and the source of data.

Table 1: Variables description and measurement

Variable	Measurement	Source
EPI (Environment Performance)	<i>Country Index</i>	<i>Yale University</i>
SE (Sharing Economy)	<i>Country Index</i>	<i>Consumer Choice Center</i>
FDI (Foreign Direct Investments)	<i>% of GDP</i>	<i>UNCTAD</i>
URB (Urbanization)	<i>% of the Urban Population</i>	<i>UNCTAD</i>
POPD (Population Density)	<i>Thousands of inhabitants / Sq Km</i>	<i>WORLD BANK</i>
IND (Industrialization)	<i>% of GDP</i>	<i>WORLD BANK</i>
EDU (Education)	<i>Mean Years of Schooling</i>	<i>UNDP</i>
ISO (ISO14001)	<i>Certifications / thousand of inhabitants</i>	<i>International Organization for Standardization</i>

Source: Authors

The dependent variable in this study is environmental performance, measured by the Environmental Performance Index (EPI). The Environmental Performance Index (EPI) is a data-driven report that summarizes the state of sustainability around the world. The EPI uses 40 performance indicators across 11 issue categories to rank 180 countries based on their progress toward improving environmental health, protecting ecosystem vitality, and mitigating climate change. This ranking allows for a comparison of countries' progress toward sustainability goals and provides insight into the overall state of the environment on a global scale. The independent variable is the sharing economy, measured by the Sharing Economy Index (SEI), which provides an overview of the sharing economy services available to consumers in 60 cities around the world.

The study includes six control variables that represent factors that could potentially impact environmental performance besides the primary independent variable. These factors were derived from the literature and include foreign direct investments (FDI), urbanization (URB), population density (POPD), industrialization (IND), education (EDU), and the presence of ISO 14001 certification (ISO).

Research Model

The study uses a panel data regression model, where environmental performance is the dependent variable and sharing economy is the independent variable, plus the six control variables. This allows the researchers to control for other factors that could potentially impact environmental performance and to better understand the relationship between sharing economy and environmental performance.

The regression model used in this study is the following:

$$\begin{aligned} \text{Environmental Performance} &= f(\text{Sharing Economy}, \text{Control Variables}) \\ \text{EPI}_{it} &= \alpha_{it} + \beta_1 \text{SE}_{it} + \beta_2 \text{SE}_{it} + \beta_3 \text{FDI}_{it} + \beta_4 \text{URB}_{it} + \beta_5 \text{POP}_{it} + \beta_6 \text{IND}_{it} \\ &\quad + \beta_7 \text{EDU}_{it} + \beta_8 \text{ISO}_{it} + \varepsilon_{it} \end{aligned}$$

Where:

EPI_{it} = Environmental Performance Index for country i in year t

SE_{it} = Sharing Economy score for country i in year t

FDI_{it} = Foreign Direct Investments for country i in year t

URB_{it} = Urbanization for country i in year t

POP_{it} = Population density for country i in year t

IND_{it} = Industrialization for country i in year t

EDU_{it} = Education level for country i in year t

ISO_{it} = ISO14001 certifications for country i in year t

ε_{it} is the error term

Results and Discussion

Table 2 presents the descriptive statistics of the variables, which include the number of observations, the mean values, the standard deviation, and minimum/maximum values.

Table 2: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SE	88	76.335	13.57	40	100
EPI	88	64.099	11.75	32.85	82.5
FDI	88	4.051	15.788	-21.433	139.42
URB	88	75.272	12.05	53.76	98.117
POPD	88	.146	.245	.003	1.615
IND	83	24.086	6.599	11.176	40.867
EDU	88	12.103	1.516	7.6	14.091
ISO	88	.329	.277	.01	1.186

Table 3 presents the regression results. Based on the Housman test values, it was decided to run the random effects regression model.

Table 3: Regression results on SE-EPI relationship – Random Effects

VARIABLES	EPI
SE	-0.205*** (0.0794)
FDI	0.00644 (0.0175)
URB	0.109 (0.0952)
POPD	3.292 (4.736)
IND	-0.384*** (0.140)
EDU	3.193*** (0.718)
ISO	14.51*** (3.130)
CONSTANT	39.19*** (13.63)
Observations	83
Number of CountryCodes	43
Standard errors in parentheses; *** p<.01, ** p<.05, * p<.1	

Source: Stata

According to the results of the random effects model, only four out of seven variables in our study have a significant relationship with environmental performance, i.e., sharing economy, industrialization, education, and ISO14001 certifications. Our regression analysis shows that an increase of 1 unit in sharing economy index is associated with a decline of 0.205 units in the environmental performance index. This relationship is statistically significant at the 1% level.

4. Conclusions and recommendations

Implications

The findings of this study suggest that, from a strictly environmental perspective, sharing economy may be doing more harm than good. This is in contrast to the popular view that sharing economy promotes resource efficiency and reduces waste, which would be expected to have a positive impact on the environment.

One possible explanation for this finding is that the increased use of shared goods and services may also require more energy, especially in terms of transportation, which could increase carbon emissions and other forms of pollution. In addition, the quality of shared goods is a key factor in the environmental sustainability of sharing economy. If shared goods are not well-maintained or are of poor quality, they may not be as environmentally friendly as they could be.

Our study also found that industrialization has a negative impact on environmental performance, which is consistent with previous research. In addition, we found that population education level and ISO 14001 certifications have a positive impact on environmental performance. All three of these relationships are statistically significant at the 1% level.

Contrary to our expectations, we found that the relationship between foreign direct investment, urbanization, and population density and environmental performance was statistically insignificant. This suggests that these factors may not have as strong of an impact on environmental performance as previously thought.

Overall, our study highlights the need for further research on the environmental sustainability of sharing economy. While it has the potential to promote resource efficiency and reduce waste, it is important to carefully consider its potential negative impacts on the environment. This will be essential for ensuring that sharing economy can be a sustainable and eco-friendly model for the future.

Recommendations

The sharing economy, also known as the peer-to-peer economy or gig economy, refers to the growing trend of individuals and businesses sharing their resources, including physical assets such as cars, homes, and other items, with others for a fee. This type of economy has gained popularity in recent years thanks to the rise of technology platforms that make it easy for people to connect and share resources.

One of the key recommendations for improving the environmental dimension of the sharing economy is to implement proper regulation. This can take many forms, such as licensing requirements for sharing businesses, safety standards for shared assets, and consumer protection measures. Proper regulation can help ensure that the sharing economy operates in a way that is safe, fair, and sustainable for all parties involved.

Another recommendation is to impose fees on the use of shared assets. This can help control the intensity of use and prevent overconsumption of resources. For example, a fee for car-sharing could help discourage people from using shared cars excessively, which would reduce traffic congestion and CO₂ emissions.

Another recommendation is to disallow the use of old homes and cars in sharing arrangements. This would help ensure that shared assets are well-maintained and safe for use and would also encourage the use of newer, more energy-efficient assets. This could also help reduce CO₂ emissions, as older homes and cars are typically less energy-efficient than newer ones.

Finally, one potential strategy for reducing traffic congestion and CO₂ emissions is to limit the use of car-sharing to night hours only. This would help reduce the number of cars on the road during peak hours when traffic is heaviest, and emissions are at their highest. By limiting car-sharing to night hours, it would be possible to reduce congestion and emissions while still providing people with access to shared cars when they need them.

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Virtual Reality in Albanian Museums and Archaeological Sites: A new challenging opportunity

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Abstract

In recent years virtual reality (VR) has gained popularity and has grown significantly in museum environments in an attempt for museums to embrace technological innovations and adapt to the challenges of the digital era. VR has been used for reconstructing historical environments, for interpretation and experience enhancement both on-side and off-side, for increased visitor engagement and education, and for creating interactive, engaging, and immersive experiences in museum environments. Albania is rich of museums and archaeological sites, and also offers an opportunity for dark tourism segment. This paper presents the potential and challenges of using VR technology in Albanian museums and archaeological sites for an enhanced experience of both locals and tourists, and as an educational tool for school pupils.

Keywords: virtual reality, technological innovations, museums, archaeological sites

Jel Code: Z32, O30, I20,

Introduction

There are many applications and research of VR in different fields, such as VR surgical simulator, as treatment of post-traumatic stress disorder, VR pilot training, VR gaming, and VR shopping, education, as a marketing tool for promotion and communication purposes during the pre-travel phase, for effectively promoting theme parks, VR is being used to create museum tours, make exhibits interactive, in events and conferences. VR technologies can be used for as an educational/entertainment tool and as an instrument of historic research, simulation, and reconstruction. VR is able to transport visitors to collections housed on the other side of the world, without ever having to set foot on an aeroplane. VR has brought down

the final walls, has brought the world into our homes and made possible from our home to enter the world (Cranford, 1996).

VR technologies are characterized by three key elements: 1- visualisation, refers to the ability of the user to look around; 2- immersion, refers to the level of encompassment of VR; and 3- interactivity, degree of control over the experience (Williams & Hobson, 1995). Compared to QuickTime VR, which stitches together photographs to cover a complete circle and allows the user to move back and forth to gather information, but when too close the image becomes blurred, in VR applications the high degree of interaction is the main feature, where users can freely navigate from any desirable angle and explore and interact with the object, they can choose the perspective, that is how the user sees the virtual environment, which leads to immersion (Schuemie et al. 2001).

VR allows the additional possibility for the participant to be a more active agent in the virtual environment, not just a passive observer (Sheridan, 2000). Because they enable the user to actively engage and determine the experience, VR technologies are considered to offer “better than being there” experiences. VR models allow users to observe an environment from an unlimited number of perspectives instead of just a bird’s-eye view. Also, VR aims at simplifying the user’s life by bringing virtual information not only to his immediate surroundings, but also to any indirect view of the real-world environment, such as live-video stream. While using VR technologies entertainment experience is the strongest predictor of tourist experience (Jung et al. 2016).

A VR experience can be described by its capacity to provide physical immersion and psychological presence (Gutierrez, Vexo, & Thalmann, 2008). To be immersed one must be isolated from the real world and there are different states of immersion like: “fully immersive system” where the user is fully encompassed by the VR and has no interaction with the real world, non-immersive and semi-immersive where the user retain some contact with the real world (Gutierrez et al., 2008). Research shows that the more sophisticated the VR technology, the higher the degree of immersion and the level of presence (Diemer et al., 2015). On the other hand, Slater and Wilbur (1997) explain immersion as a measurable aspect of display technology that comprises four determinants: *inclusive* (the degree to which the physical reality is omitted), *surrounding* (extent to which the display allows a panoramic view), *extensive* (variety of sensory modalities accommodated), and *vivid* (aspects such as resolution and fidelity). Presence describes the feeling of “being there”, and is not bound to any specific technology, as it is a product of the mind (Schuemie, 2001; Ijsselsteijn and Riva, 2003).

The visual and auditory aspects of VR are the most important features regarding their ability to stimulate affectively different senses, yet the system’s particular use must be considered *ad hoc* (Guttentag, 2010). Advances in VR technology will increase their ability to stimulate the five senses and improve user interaction.

The emphasis of this paper is to give an accurate literature review on the advantages that VR technology offers for the tourism industry, and museums specifically. Based on the insights gained, the paper concludes by assessing the possibilities and challenges that Albanian museums might

face on the development of VR applications, and some particular considerations to be taken into account by both museum professionals and VR designers when adapting this innovative technology in the Albanian context.

Virtual Reality in Tourism

Advances in technology have direct effect on tourism. They alter the ways in which tourism products and services are managed, placed and promoted on the market, which implies a corresponding change in the way travellers get inspired, book, plan and experience travel. Emerging Information and Communication Technologies contribute to re-engineering systems and processes, by impacting operational, structural and strategic levels.

Though the first appearance of Augmented Reality (AR) dates back to the 1950s, throughout the years technological advances have brought it closer to the real-world environment and around the 1990s scholarly started to show interest on the application of VR in tourism (Hobson and Williams, 1995). VR is the use of computer-generated 3D environment- called virtual environment- that one can navigate and possibly interact with, resulting in real time simulations of one or more user's five senses (Guttentag, 2010).

Through the use of VR tourism, people can travel anywhere using VR applications and wearing VR devices (Tussyadiah et al. 2018). Virtual reality (VR) tourism, using the three-dimensional (3D) world of an innovative technology, is formed via a combination of visual, kinetic, and audio elements so that users can actually experience a real object from a tourist perspective (Williams and Hobson 1995).

VR is described as a technology with a wide range of applications which are predicted to have a profound influence on the future of the tourism industry (Guttentag, 2010; Tussyadiah et al., 2018). Mostly because tourism products and services are intangible, VR would enrich and enhance information phases of the customer journey by providing tourists the opportunity to have "a taste" of the tourism experience and to engage with trustworthy and rich information (Rainoldi et al., 2018). The advances in technology have made possible for tourists to perceive a more real and immersive environment while using VR systems, conveying stronger social presence: "the extent to which other beings (living or synthetic) also exist in the virtual environment" (Schuemie et al., 2001, p. 184), and perceiving a lesser artificial or mediated presence (Jung, tom Dieck, Lee, & Chung, 2016).

Different countries, The Maldives, Sweden, Estonia are among the first ones, and hospitality organizations such as Ritz, Starwood, Hyatt, and Crowne Plaza, have exploited the possibilities offered by VR in the tourism industry and have created their virtual embassies in the Second Life virtual world (<https://www.diplomacy.edu/event/diplomacy-goes-virtual-inauguration-diplomacy-island-and-virtual-embassy-second-life/>).

Even though VR technologies are among the most important technological innovations of the 20th century (Hobson, & Williams, 1995) they are still in the introduction stage of the product life cycle (Disztinger, Schlogl, & Groth, 2017). Shehade & Stylianou-Lambert (2020) conducted a study with 15 museum representatives from around the world and found that in

most of them, the VR technology was introduced after 2015 and in only six of them VR technology is incorporated on a permanent basis.

Virtual reality in museums

Museums are places that include collections of varied content and they aim communication. Museums are unique places that enrich and support the learning process of individuals of all ages and are considered to be institutions that contribute to lifelong learning. The museum acquires, maintains, communicates and exhibits the material testimonies of humans and their environment, aiming at study, education and entertainment (Mirogianni-Arvaniti,1999). Museums are unique places that enrich and support the learning process of individuals of all ages. One of the most important aspects of the museum's social role is education, rendering them unique places that can enrich and support the learning process (Zouboula, Fokides, Tsolakidis, & Vrat, 2008). More importantly, museums—at the core of their responsibility as a cultural institution, and as a center for the dissemination of knowledge—can provide, through various media and narratives, an experience of the past (Ch'ng, Cai, & Thwaites, 2018). ICT can contribute successfully in the evolution of museums and in the promotion of their role in the learning process (Zouboula, Fokides, Tsolakidis, & Vrat, 2008) as a matter of fact, digitalization induces a fundamental change: museums from occasional and static means of authority become means of daily, dynamic, direct and personal instruction (Arvanitis, 2002).

In a museum's environment, learning takes place within three frames: i) *the personal context* which refers to the degree of intrinsic and/or extrinsic motivation shown by learners, since learning outcomes are greatly affected by the motivation, ii) *the physical context* which describes the sets of cues that help learners make sense of phenomena, artefacts and events, that are often more difficult to appreciate in formal education and finally iii) *the sociocultural context* deals with the interactions between learners/visitors and the place of learning/museum (Zouboula, et al. 2008)

In the last few years there has been a considerable increase in the use of VR in museum environments in an attempt by museums to embrace technological innovations and adapt to the challenges of the digital era. Many museums around the world are incorporating such technologies in an attempt to democratize and open up their collection and to allow multiple interpretations (Economou, 2016)

In museums VR technology is used to add virtual objects to the real environment, show information to the user that the user cannot directly detect with his senses. Different application of VR in museums comprise usage for visitor experience enhancement, engagement and education, usage for reconstructing historical environments and for immersive experiences in museum environments (Gonizzi Barsanti, Caruso, Micoli, Covarrubias Rodriguez, & Guidi, 2015; Pantile, Frasca, Mazzeo, & Ventralla, 2016; Shah & Ghazali, 2018; Kang & Yang, 2020)

Technology is solving one of the largest problematic issues concerning cultural heritage assets— non-destructive public access (Refsland, Ojika, Addison, & Stone, 2000). ICT in museums has a wide application such as management and documentations of collections, digital museums which on the other hand gave rise to the virtual museum. There is an increasing number of museums that present part or all of their exhibits digitally and offer virtual tours. VR offers the opportunity to tourists to visit endangered sites as a substitute to the real visitation in order to sustain heritage attractions and destinations for generations to come (Guttentag, 2010).

Different museums around the world have adopted VR and have introduced temporary or permanent installations such as Paris' Louvre (<https://www.louvre.fr/en/online-tours>) introduced Mona Lisa: Beyond the Glass; in The Peterson Automotive Museum in Los Angeles visitors were able to interact with a classic American sports car, the Ford GT40 (<https://www.viator.com/Los-Angeles-attractions/Petersen-Automotive-Museum>), The National Museum of Finland exhibited R. W. Ekman's painting The Opening of the Diet 1863 by Alexander II (<https://www.kansallismuseo.fi/en/>); the Smithsonian Institution (<https://americanart.si.edu/exhibitions/burning-man>) introduced the instalment "No Spectators: The Art of Burning"; The National Museum of Natural History, in New York (<https://naturalhistory.si.edu/visit/virtual-tour>) launched its first permanent VR exhibition in 2018. The installation is part of the wider scope of the museum: evolution. Visitors are fully immersed in a journey of discovery when they enter the "Cabinet of Reality"; Uffizi Gallery, Florence (<https://www.virtualuffizi.com/map-%26-virtual-tour.html>); Tate Modern in London (<https://www.tate.org.uk/about-us/>); and the Kremer Museum has gone one further than the examples above (<https://www.thekremercollection.com/the-kremer-museum>). It showcases over 70 17th Century Dutch and Flemish old masters which are only available to view through the VR experience and do not exist together as a physical collection, nor the physical museum exist at all.

By the passage of time, the physicality of any material will inevitably decline, erode and any unfortunate disasters, including threats from deliberate destruction of monuments, that's why digital preservation is important (Kang & Yang, 2020) and in the future VR can be used "for increasing value, for both cultural heritage and our users" (Ch'ng, Cai, & Thwaites, 2018). Virtual 3D models of archaeological sites and objects are considered crucial for heritage preservation because of the accuracy and precision of data sets that can be stored indefinitely on them (Cignoni & Scopigno, 2008). VR models can help in identifying degradation and as blueprints for restoration because they provide information on the earlier forms of archaeological sites and objects

For museum professionals, VR in museums can be used to promote new ways of understanding art, objects and concepts, and can allow visitors to explore their ideas on these concepts (Shehade & Stylianou-Lambert, 2020), but As Economou notes, "digital technology is not simply an innocent tool in our effort to record and understand the past, for it inevitably affects and shapes drastically how we experience cultural heritage" (Economou, 2016).

In museums VR is used to allow the visitor to experience a space that is no longer accessible or to time travel, such as a place depicted in a painting or the actual studio of an artist; to immerse the visitor in history and places that cannot be currently experienced; as a

vehicle for further community engagement; for educational aspects; to allow visitors to experience places that cannot be accessed easily (such as the bottom of the ocean) and to deepen visitors' understanding on topics relating to climate change, wildlife (Shehade & Stylianou-Lambert, 2020). More and more VR applications are developed and introduced in museums because visitors envision digital experiences as non-intruding on other people's visit and not interfering with the experience flow of other visitors (Shehade & Stylianou-Lambert, 2020).

Virtual reality in Albanian museums and archaeological sites

Albania is a country in Southwestern Europe, in the Balkan peninsula. In the first years after the World War II the country developed foreign relations with other communist countries and after their relation deteriorated around the 70's the country was in total isolation. For 45 years Albania, was closed to foreigners in general and tourists particularly. After the fall of the communist system, Albania was opened to foreign investment and tourists. During the first years the number of visitors was slight due to low visitor awareness of Albania, but nowadays the landscape has changed a lot. Tourists who visit Albania are growing in numbers and they have a large interest in Albania's history. Approximately 5.7 million people have entered Albania during 2021, and 5.4 million entered the country for holidays, leisure, or visit to relatives (INSAT). In terms of nationalities most likely to visit were Spanish, followed by Polish. Thanks to rich natural and cultural heritage Albania is a destination which offers possibilities for adventure tourism, religious tourism, experiential tourism, dental tourism, sports tourism, cultural tourism, heritage tourism.

In Albania there are 53 museums: 6 archaeological museums, 21 historic museums, 10 ethnographic museums, 13 art and collection museums, and 3 religious museums; and 18 of them were constructed and opened to visitors after the disintegration of communist system. Whereas per archeologic sites there are approximately 30, and among the most important are Butrinti, Apollonia, Durrahu, Lisi.

The demand to visit the museums and archaeological sites is high, but unfortunately these sites generally lack technological devices, or the existing ones are too old and outdated.

Albania is a destination which offers to visitors an experience of dark tourism. Dark tourism is defined as the act of tourists traveling to sites of death, tragedy, and suffering (Foley and Lennon, 1996). House of Leaves, BunkArt 1 and BunkArt 2 are among the most frequently visited museums representing dark tourism in Tirana, capital city of Albania, by school pupils, accompanied by history teachers so that they can learn and witness an important part of Albania's recent history. Also, there is a high demand from tourist for these museums as they display objects revealing life during the communist system. Other dark tourism sites are Albanian bunkers galore, Spac prison, House of Martyr's Cemetery.

Even though Albania is classified and an *emerging innovator* by European Innovation Scoreboard (EIS, 2022), Albanian government is taking small, but steady steps toward ICT and innovation. Digital technologies are gradually introduced in different public services and it is time to use virtual reality technology devices in Albanian museums and archaeological sites in

order to create a place when youngsters can experience the far past of their ancestors. This would be a valuable experience for pupils and also would leverage their desire to learn more about history (Zouboula et al., 2008).

Some questions should be taken into account prior to VR introduction in Albanian museums:

In which museums will it be applied first?

Which historical periods should be included?

Is a good idea to use it on dark tourism sites?

To which visitor segment should it be available?

What would be the level of “immersion” provided?

How will this technology affect the price of the ticket?

What would be the pricing strategy?

Which museum departments would be responsible for handling VR?

Should the museum carry out the VR projects by in its own or in collaboration with an external company?

Yet, there are some limiting factors preventing the adaptation of VR systems in Albanian museums. One of them is cost. VR equipment itself is expensive. In addition, the design and management of VR programmes can be very more expensive. Depending on the size of the project, costs can escalate quickly. Other factors are to take into account, from paying for bespoke content design to replacing broken headpieces.

Hygiene is another concerning issue. Headsets will be used by several people over the course of a day. Things like skin, hair and grease can easily build up. There is potential for this to cause infections. Having a staff or volunteers to clean the devices between uses can be helpful, yet the cost for cleaning products should be added to total cost.

Some visitors might suffer Simulation Sickness, having an unsettling VR experience or even nausea due to the disconnection between the physical body and the virtual world that the mind is immersed in. Headache, eyestrain, disorientation, vertigo and even vomiting might be some of the symptoms. Training some of the employees of the museum to give the first aid might be imperative.

One cannot but wonder, as people can experience the virtual reality without stepping foot in the museums, what will be the future of museums in terms of visitors? According to Pine & Gilmore, (1999) we are living in the experience economy and people are willing to pay to have genuine authentic experiences and as authentic as an VR experience can be, it can never replace the emotion that the real object elicits, so people will always go to museums and archaeological sites to witness in person history and art, willing to use VR systems to enhance their experience. The innovativeness of the technologies used within a museum isn't of primary relevance for

the visitors. To audiences matter activities/products that serve them and help in the enrichment of their experience.

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Facilitating Circular Economy for more Resilient Road Transportation, in the context of Albania

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Abstract

The transport sector significantly impacts the environment, specifically on climate change, through greenhouse gas emissions and depletion of natural resources. Currently road transport already creates 14% of the emissions globally and furthermore the number of vehicles is expected to more than double by 2050. [1]

In the context of Albania, transport sector plays a significant role in environmental pollution concentration. According the time-series data published by INSTAT (Statistic institute in Albania) the transport sector is an important activity in Albanian economy and its contribution to GDP during the last decades has been increased by 23%. Moreover, for the past 10 years a total number of road vehicles in Albania is increased by 46%, making the transport sector the second main contributors, to greenhouse gas (GHG) emissions with about 25% of its total, while in the first place is ranked agriculture sector.[2]

Therefore, many studies recommend applying the circular economy concept to reduce the negative effects of the above-mentioned issues. Circular economy concept is a new and inclusive economic paradigm that addresses resource scarcity concerns to minimize pollution, waste and extend product lifecycles. This concept stands as an opportunity to rethink urban planning and redesign transport into a more circular concept that goes beyond reduced emissions from transportation sector to create a healthier environment in urban areas.

This article aims to examine the effect of a circular economy on the transportation sector by highlighting some of the best practices obtained through a literature review, helping to provide a set of recommendations on how the application of this concept will affect the current context of transport infrastructure in Albania.

Keywords: circular economy, transport infrastructure, sustainability, smart city, future transport

Jel Code: I11, N70, Q50

1. Introduction

Transport is a leading source of greenhouse gas emissions, together with agriculture, industry, and the built environment. Road transport creates 15% of the emissions from the sector, and its impact is set to grow.[1] Furthermore, by 2050, the number of cars on our roads is expected to double. [3] These predictions raise a debate about the future availability of natural resources putting it at the center of attention. Considering this significant impact on climate stemming from the fuel that powers our cars is well known but not the impact of manufacturing them. The process of producing them is very carbon intensive, considering the refinement of many components such as steel, rubber, glass, etc. According to Ellen MacArthur Foundation (2020) comparison, the 12 largest automotive manufacturers generate more greenhouse gases yearly than the European Union. Therefore, for the past few years, the impact on the environment of this process has taken the attention of many authors by contributing various methodologies and concepts as a solution to this concern. [1], [3]–[5]

The two most common concepts elaborated by different studies aiming to reduce the percentage of emissions created by the transport sector are the green economy and the recently re-emerged circular economy [1], [3], [5], [6]. These two concepts are recently discussed and integrated into scientific circles and policy development as crucial areas for sustainability development. The green economy acts as the umbrella concept that includes all components of the circular economy concept. In many studies, the green economy's role is defined as defining the problem; meanwhile, the circular economy aims to create and develop tools for solving environmental and energy issues by extending the life cycle of a product [1].

Therefore, many authors suggest a circular economy as a possible solution, which theoretically can contribute to decreasing emissions by eliminating waste formation.

Approaching this concept globally would address Paris's agreement goal to reduce temperatures to 1.5 degrees Celsius of pre-industrial levels. Currently, on a global scale, only a third of countries' climate consider updating the circular economy concept in strategies regarding carbon emissions reduction. [7]

This article aims to examine the effect of a circular economy on the transportation sector by highlighting some of the best practices obtained through a literature review, helping to provide a set of recommendations on how the application of this concept will affect the current context of transport infrastructure in Albania.

2. Literature Review

2.1. Understanding circular economy concept

A circular economy (CE) is a type of economy that integrates principles and approaches originating from all the different types of philosophies/approaches. CE was first mentioned in 1990 by Pearce and Turner, who also modeled it. Although there is not yet a definitive definition of the circular economy concept, one most widely is that of the Ellen MacArthur Foundation (EMF): *“economy that is restorative and regenerative by design, and which aims to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles.”*

Even though in February 2021, the European Parliament announced a resolution based on the circular economy, considering measures and action plans aiming to achieve a decarbonization environment, and sustainable economy by 2050, CE still stands as a new paradigm and explores mostly thematically as a concept. Currently, only a third of countries ‘climate consider integrating the circular economy in their strategic plan in order to reduce carbon emissions. [7]

On the one hand, many authors refer to CE as a model of production and consumption, including sharing, leasing, reuse, repair, restoration, and recycling of existing materials and products for the maximum possible period. [3], [8], [9] CE seeks to reduce resource consumption by creating new strategies for redesigning industrial systems to be more restorative and regenerative. [7], [8], [10]–[12]

Changing this economic pattern, the impact is mainly on the service provider in the current context. In this case, the producer companies would reduce the energy consumption in the production process and raise the resource expenditure.[3] Therefore, in a well-structured circular economy model, the inventors and investors should be focused on avoiding the recycling stage at all costs to prevent waste generation, which stands as the main aim of the CE concept [8]

On the other hand, many authors refer CE concept as the most appropriate solution for achieving sustainable development. Still, they highlight that CE is a concept that needs more elaboration, specifically in the transport sector. [7], [9], [11], [13]–[16] Considerable efforts are needed to promote a regulatory and legislative framework that ensures the expansion of the influence of the circular economy, which will allow companies to remain competitive and profit from their activities, preserving the environment and benefiting society.[7] Another approach combines the CE concept with other economic models, such as green economy, collaborative/sharing economy, and restorative/regenerative economy. [1], [3], [5], [6]

Table 1: Definitions of 4th economy concepts

Economy Model	Defintion	Author
Green Economy	<i>“well-being and social equity, while significantly reducing environmental risks and ecological scarcities”</i>	United Nations Environment Programme (UNEP) (2011)
Circular Economy	<i>“economy that is restorative and regenerative by design, and which aims to keep products, components, and materials at their highest utility and value at all times, distinguishing between technical and biological cycles “</i>	Ellen MacArthur Foundation (EMF) (2012)
Collaborative/ Sharing Economy	<i>Collaborative consumption has also been defined as ‘a peer-to peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services “</i>	Hamari, Sjöklint, and Ukkonen (2015)
Restorative/ Regenerative Economy	<i>“a generative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing, and narrowing material and energy loops “</i>	Geissdoerfer et al. (2017)

Source: Prepared by the authors based on the following references: [4], [5], [8], [17]

According to Lisitsa et al., (2022), the green economy concept can contribute to defining and addressing problems. Still, it can only solve them partially as the proportion of regenerative capabilities of nature are insufficient while the consumption and waste are in growth. Therefore, the transition to a circular economy later on, aims to eliminate the formation of waste by extending a product's lifecycle. But to reach this impact, the process involves many actors who should collaborate on implementing this concept. Additionally, two economy models, collaborative and regenerative economy, stand as branches of circular economy, contributing to the circular system as the main tools. [3], [7], [9]

A collaborative or sharing economy aims to change the way of the current process of production, consumption, finance, and education. This type of economy plays an essential role in inventor and investor collaboration; therefore, it doesn't stand only at an institutional level of operation.[8]

The restorative or regenerative economy consists of a type of economy that highlights the need to create a new relationship between industrial systems and ecosystems. This type of economy aims to integrate the system of nature with the industrial to restore the impact production and consumption have on the environment [8], [16]

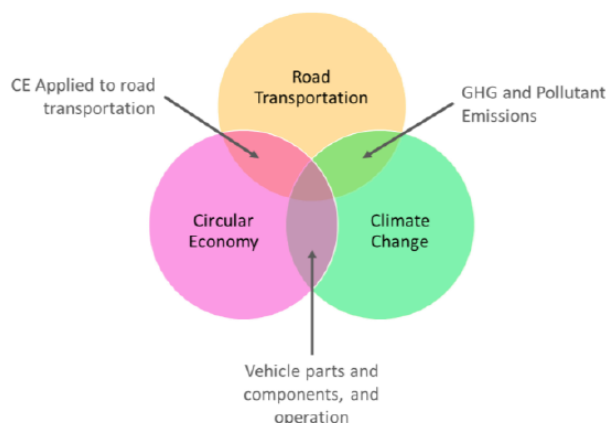
In this context, changing this economic pattern and creating a new system that combines four models as complementary to each other, potentially implemented in strategic legislative frameworks by different government bodies.

Circular economy and its impact on transport sector

The transport sector's impact on the environment took the attention of many researchers. The current climate situation emerges as an essential aim of net-zero transport to ensure a sustainable future. As the number of vehicles keeps growing daily, the implementation of more environmental economy concepts emerges. [9], [16]

As mentioned in the previous section, there are some economic models created and developed, one after the other aiming to reduce the percentage of emissions. As many authors suggest, Circular Economy (CE) is one of the most suitable models that can contribute significantly to the impact of the transport sector on the environment. Adopting a circular approach can contribute in the coming years to reaching sustainable transport development by considering all stages of the circular economy in the transport sector. [8]

Figure 1: The relation between Road Transport, Circular Economy and Climate Change



Source: Source: De Abreu et al. 2022

As shown in fig.1, the CE concept can have a significant role in the transport sector, as well as in climate change, by aiming at reducing the percentage of emissions on the environment caused mainly by road transport and achieving more sustainable transportation. Furthermore, the benefits of CE can go beyond reduced emissions from transport and create liable cities and more resilient communities. [7], [8]

This approach brings to the attention the necessity of rethinking the designing process of transport in all dimensions. As changing transport system requires changing the context where we move. Therefore, a circular approach should be integrated into all dimensions as a solution for more sustainable transport. [3] But how can a circular economy help decarbonize transport? According to EMF's (2012) analysis, applying a circular system to the designing and production process of vehicles can reduce emissions by 70% by 2050, or 285 million tons of CO₂ equivalent. [3] To reach that result, EMF (2020) recommends that vehicles be designed to be lighter and more durable and make them electrical. [1], [5] If the vehicles are designed lightweight, fewer materials are needed to produce them, and less energy is necessary to consume. According to Ellen MacArthur Foundation (EMF) (2020), this system would reduce 89 million tons of CO₂ equivalent per year by 2050.

Adapting the EC concept to all technologies used in the transport sector in the most sustainable way is vital. The impact of this approach would be not only in the environmental aspect but also in the social and economic aspects.

Figure 1: The relation between Road Transport, Circular Economy



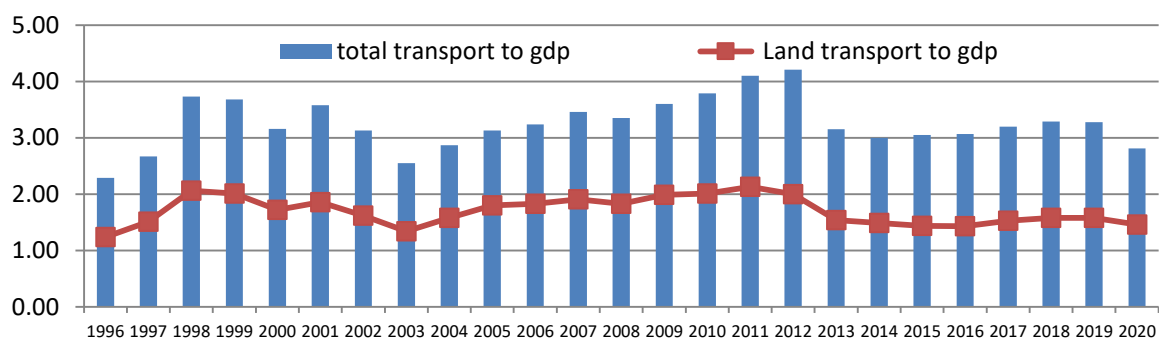
Source: De Abreu et al. 2022

As interpreted in fig.2, the CE concept aims to reduce raw materials to minimize the environmental impact; therefore, while rethinking designing vehicles, the battery must be designed based on the circularity concept with a second or third life and ending to the recycling process.[1] Adopting the circular economy for transportation means developing an innovative system which consists on reducing end-of-life waste, or embracing materials in planning and designing new, innovative solutions. [5], [9]

Transport infrastructure in Albania in the last decade

The transport sector is one of the main contributors to emissions. According to European Union (EU), 25% of gas emissions are caused by the transport sector. In Albania, the transport sector has a significant role in gas emissions. [18] According to the time-series data published by, INSTAT (Statistics Institute in Albania) the transport sector is an important activity in Albanian economy and its contribution to GDP on yearly base, is estimated in average for about 3.2%. It's interesting to underline also that about 52% of GDP on transport sector, its due to the contribution of road transport which shows a positive growth rate during the last two decades. [18]

Table 1: Transport sector impact to the national economy

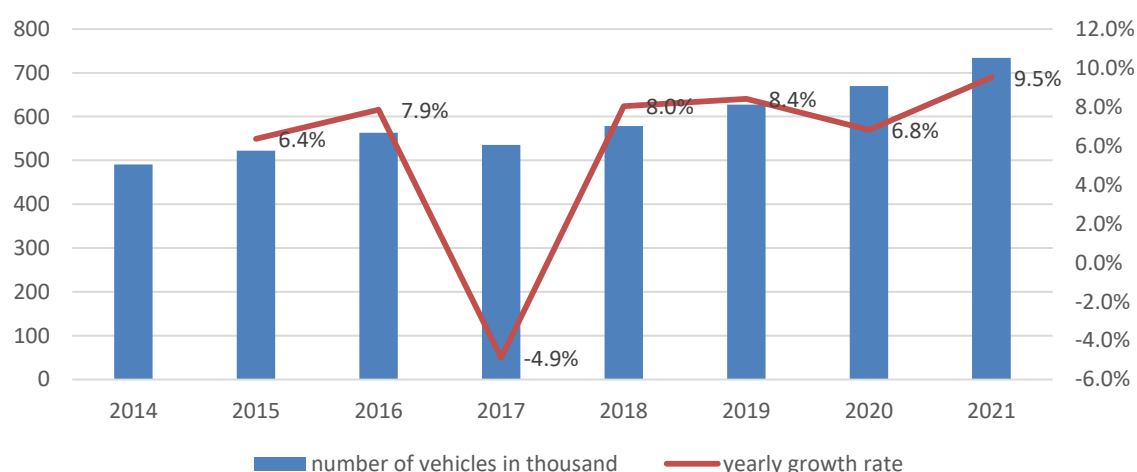


Source: INSTAT (Institute of Statistics in Albania)

Although the national economy has performed a positive growth rate during the last decades, the growth rate of transport sector to GDP and especially the road transport, as shown on the graph 1, demonstrate a fluctuation and the lowest annual growth rate is estimated in year 2013th, respectively by (-25% and -23.7%). During the last decade there is an improvement of the transport sector’s performance, but the positive annual growth rate is lower compare with to the previous one. [18]

In addition to the previous section, it is interesting to mention also the positive annual growth rate of total number of vehicles, during the past seven years. According to the tab.2. except the year 2017, there is quite a positive trend in volume term for road vehicles in Albania shown through years, where the highest growth is estimated on the year 2021 by accounting 9.5%. [18]

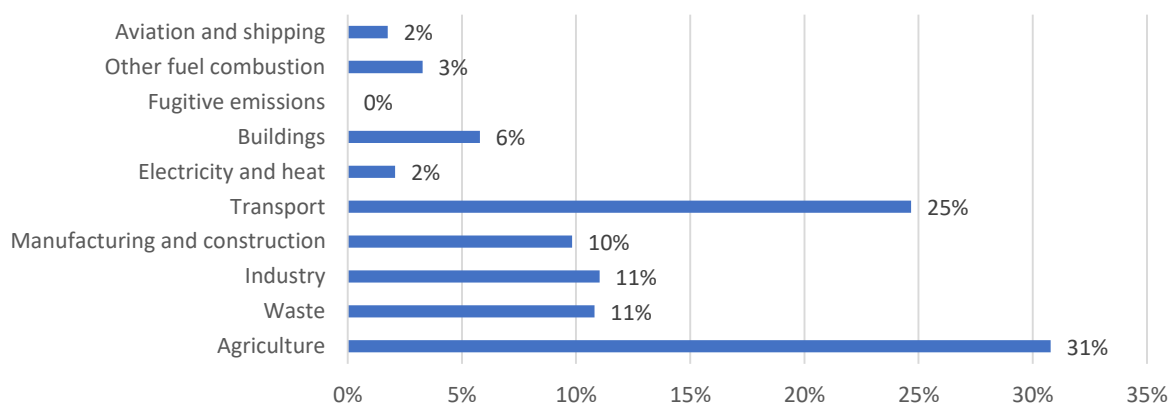
Chart 2: Inventory Structure of road vehicles by year, in Albania



Source: INSTAT (Institute of Statistics in Albania)

Referring to these results of the current situation, the transport sector certainly plays a crucial role in gas emissions by making it the second main contributor to greenhouse gas (GHG) emissions with about 25% of its total, while in the first place is ranked agriculture sector. [18]

Chart 4: Greenhouse gas emissions by sector, Albania 2019



Source: Our world in data.

From the overview, it is noticeable that in Albania's context, the transport sector is negatively impacting the quality of life in cities. Therefore, to significantly reduce emissions and meet the Paris Agreement's (PA) long-term goal of decarbonizing the transport sector, it is important to intervene by prioritizing circular concept integration on transport policies. [19]

Circular economy in Albania

In the context of Albania, in the current legal framework, circular economy concept is not taken in consideration in any of regulations and national strategic development plans. Circular economy was first mentioned on 2018th in a draft Strategy on Integrated Waste Management (2018-2023), as a concept of aiming that the waste is collected and treated as raw materials based on circularity systems. However, CE is still in early stages in terms of adaption, prevention, and implementation. [19]

Recently are some initiatives from several business companies in Albania, aiming on adopting CE concept, but none of them actually referrers to transport sector. These companies, have shifted some of their business activity into CE concept, focusing mostly on waste management, aiming to turn the waste to resource. [20]

Referring to the transport sector as the primary contributor to gas emissions shows an urge to adopt the circular economy model in the legal framework to achieve a sustainable economy.

Methodology

This section describes the procedure used to conduct the literature review. The literature search was performed in Scopus databases, by using a search guided by keywords such as ‘road transport’, ‘transport sector’, and ‘circular economy’. Additionally, to this, a complementary research was conducted for gathering some most relevant articles such as reports, guidelines.

Based on the articles collection, the focus was on most relevant and current studies on the subject. After highlighting the main knowledge gaps that the study intends to address. Based on the literature review, we derived to a draft of a framework, which illustrates the intersection between some of main sustainable economy concepts, stages of CE model in transport sector, and its impact on four dimensions where transport sector mostly impacts. The framework/matrix concept is based on the theory of morphological box by Zwisky. [21]

In the next phase to the continuation of this study, is data collection in a specific chosen area, by using tools such as surveying conduction between different actors, data collection by different sources, site visit and mapping, in order to fulfil the matrix/framework, by data from Albania context, which would contribute on helping on developing some strategies, on how adopting circular economy in transport sector.

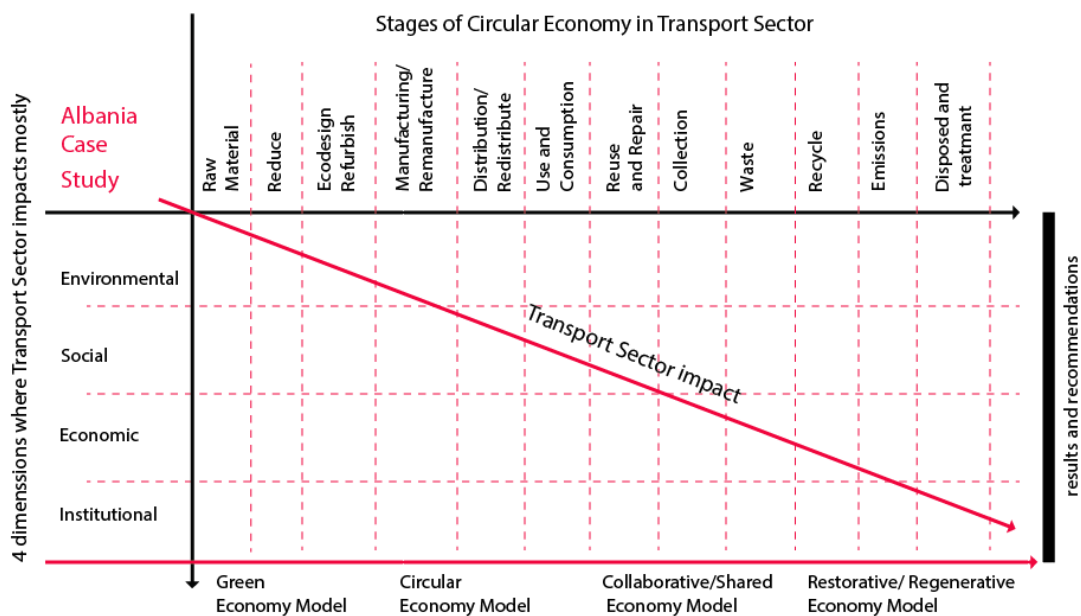
Results and Discussion

As mentioned on the previously sections, Circular Economy concept, is still in very early stages in a global scale. Circular initiatives are small in number, as well as transport sector is not very included, the focus was more in textile production as well as agriculture. Therefore, the impact of the circular activities from these initiatives, are not visible enough in the environment. Therefore, many researchers, advised to develop further circular economy model, as well as combining with other types of economic models, in order to include circular economy policies, into an establish legal framework. This approach is an urge to be included in strategic planning, specifically focusing on transport sector, which is ranked as the second contributor on gas emissions globally. The transport sector, does have the same rank as well in Albania, contributing by 25% on gas emission. Therefore, addressing a set of strategies aiming to update this concept in strategic planning, would lead the economy of Albania towards more sustainable economy, answering to many environmental issues, which mainly derives from transport sector.

According to the literature review, we concluded to a draft framework/matrix, based on the morphological methodology, by bringing on focus the impact of transport sector has in the dimensions of environment, economy, social, and institution, aiming by analyzing each stage of circular economy

defining four main sustainable economic models, which stand as complementary to each other.

Figure 1: Greenhouse gas emissions by sector, Albania 2019



Source: Authors

Recommendations

To fully realize the potential of circular economy in the current context of the transport system, we need to change the system to a new one that combines the economy models of green economy, circular economy, collaborative economy, and regenerative economy. As these models stand as complementary to each other, aiming to achieve a sustainable economy.

Therefore, the main recommendations from the current stage of this study are mainly on a macro scale.

Adopting CE model into legal framework such as national regulations and national strategic documents and action plans in order to create a more sustainable economy.

Introducing CE concept to investors and inventors, specifically in transport sector as they play a crucial role in circular system. Increasing the awareness of the impact that CE concept can create by implementing the seventh stages of CE in transport sector.

Creating a data base with info regarding transport sector in macro and micro scale in more specific indicators.

In the future steps, this study aims for data collection in the context of Albania to fulfill the matrix, which helps in developing some strategies on how specifically can the circular economy concept be adopted in the transport sector.

Limitations

As a matter of time, there was very difficult to collect data in the context of Albania, related to transport sector in both scales, macro. Therefore the study stands in early stages, by providing a briefly literature review to understand how does circular economy can impact positively in transport sector.

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Waste Management through Public–Private Partnership Models in Albania. Are incinerators the best method to achieve a circular economy?

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Abstract

Many countries in the world have emphasized the transition from a linear economy to a circular economy, with the aim of reducing waste production and achieving an efficient and sustainable management of natural resources. In Albania, the concept of the circular economy is still at an early stage and one of the most important issues to consider for the transition to the circular economy is waste management. According to the official statistics in Albania the generation of municipal waste in 2021 was 311 kg/inhabitant, remaining in high level for years.

One of the practices following for waste management in Albania is the construction of incinerators using Public Private Partnerships (PPP) model. In the last five years, three incinerators have been built as a collaboration between the private and public sectors, but only two of them have completed the incinerator plant and are operational. However, best practices in the EU recommend limiting the use of this method because it results in the release of larger pollutants into the air, which harms not only the environment but also the health of residents.

So, this research paper is an attempt to analyses how efficient is waste management through Incinerators in achieving the circular economy. Are incinerators the best way to achieve the circular economy? This research paper will provide an overview of the waste management in Albania, the methods used and their compatibility with the European Union's best practices recommendations for the circular economy.

Keywords: Circular Economy, Public Private Partnership, Waste Management, Incinerator

Jel Code: H4, Q2, Q5

Introduction

In recent decades, there has been a surge in interest in the concept of circular economy and the methods which can help on achieving it. Using the linear economic model based in the 'take-make-use-waste' premise has increased the reliance on scarce resources, resulting in both environmental damage and colossal waste. To counteract these far-reaching implications, the development of a circular economy has become a necessity. In this order, countries are using different mechanisms in managing the situation.

According to the [1] for many countries the level of investment in waste management is increased since 2000, which varies from USD 50 per capita to over USD 200 per capita in countries like Estonia, Korea, Netherlands etc.

One of the methods used to manage the colossal growth of urban waste has been the use of intensive capital infrastructure such as incinerators to manage the disposal of this waste. In fact, incineration has proven to be the most expansive waste treatment system compared to composting, recycling and even landfill.

Meanwhile, as waste management in Albania has become a major concern, the government has approved three public-private partnership models for the construction and maintenance of Incinerator plants for waste burning and energy production over the last five years. However, the European Union has raised concerns that this method is incompatible with EU waste acquis and even national waste legislation.

So, in this direction this research paper is an attempt to analyses how efficient is waste management through public private partnership models in achieving the circular economy. Are incinerators the best way to achieve the circular economy in Albania?

To answer this question this research paper will provide an overview of the waste management in Albania, methods used and their compatibility with the European Union's best practices recommendations for the circular economy.

There are three sections to this paper. A review of the literature on the waste management methods, circular economy and PPPs will be presented first, followed by a brief overview of waste management tendencies in Europe. Also, an important section will focus on waste management in Albania focusing on Incinerator plants and their effectiveness, with an attempt made to assess the extent to which circular economy ideas are used in the design and delivery of this mechanism used.

It should be highlighted that the conclusions presented here are only intended to stimulate additional investigation and discussion because they are based only on the findings of the three incinerators through public private partnerships projects in this sector.

Literature Review

The rapid industrialization of emerging economies and the ongoing high levels of material consumption in developing countries have resulted in an unprecedented increase in raw material demand in recent decades. Current population and economic growth trends place significant strains on the earth's natural resources and the environment. This has drawn more attention to resource efficiency issues, such as waste management policies, as well as circular economy solutions.

According to the Waste Framework Directive [2], waste is managed as follows: *Prevention, Reuse, Recycling, Recovery and Final Treatment or Disposal*. Referring to this hierarchy, waste prevention and re-use are the most preferred options, followed by recycling (including composting), then energy recovery, while waste disposal through landfills should be the very last resort for EU countries. Only when waste cannot be prevented or recycled, recovering its energy content is usually better than landfilling it, according to this Directive.

Prevention preserves the product before it enters the considered product management cycle waste. So, reuse tend to reduce some of the waste before it must start the treatment process where costs start to rise, and management becomes more complex. Recycling aims to preserve the composition of the material to produce other products of the same nature. The rest of the waste, which are not recycled, goes down to the other levels of the hierarchy, where recovery for energy is more preferred than storage or incineration without energy production. The last and least preferred link is that of depositing in the ground or called landfilling. [2].

To manage the waste, partnerships between private investors, individuals, and states are a popular issue in discussions about environmental governance in developing nations. For many years, public-private partnerships between private enterprises and states have served as a typical means of providing environmental infrastructure or services where state money or expertise are inadequate.

Over the last two decades, public-private partnerships (PPPs) have increased in power to bring in investment and expertise from the private sector to the delivery of public goods and services. PPPs are a tool that modern governments frequently use to fulfill their responsibilities on public infrastructure and services because of their alleged benefits in off-budget spending. If PPPs are to be a viable strategy for sustainable development, they must provide value for money throughout the life cycle, ensuring economic and financial viability, social progress, and environment protection throughout the partnership's life, from design and financing to asset/service construction and operation.[1]

Various studies suggest that the PPP waste management approach has resulted in efficient waste management in some places such as Nigeria, Lagos, and other developing nations. [3]. However, PPP has limits and is frequently a difficult process. In addition to cost, incinerators

are particularly inappropriate in developing countries for a variety of reasons. Several findings illustrate similar constraints that face the public sector: financial challenges, low quality personnel, outdated equipment, laborious procurement procedures, rigid working schedules, constraints on management changes, poor supervision, and corruption.[1]

Also, the [17] in its Circular Economy Guide published in 2019, has exclude incineration as a contributor to a Circular Economy. For decades, law in the European Union has focused on requirements aimed at minimizing waste, lowering emissions of environmentally harmful pollutants to the environment, and minimizing the impact on the environment.

Waste Management tendencies in Europe

Moving from a linear economy to circular will deliver economic, social, and environmental benefits. Economic expansion throughout the years, accompanied by a rise in consumption, has resulted in an increase in waste generation, [4]. Also, [5] study showed a positive relationship between consumption growth per capita and incinerated waste, for EU-15 member states

The European Union has long strived to achieve its policy goal of reducing waste through waste prevention, which is the first stage in the waste hierarchy outlined in the EU Waste Framework Directive. It is very important to emphasized that the European Commission adopted an ambitious Circular Economy Package, which includes revised legislative proposals on waste with a higher common target for the recycling of waste and lower limits for landfill of municipal waste. On 2018 the EU introduced new national waste management targets for municipal waste: a 10% cap for landfilling and a recycling target of 65% to be achieved by 2035. [2]

According to [6] even though more waste has been generated in the EU, the total amount of municipal waste landfilled has diminished. For the referred period 2000-2020, total municipal waste landfilled in the EU fell by 60 million tonnes, or 53.6%. However, due to the directive in force, countries have followed other methods such as composting, recycling or incineration.

Comparing to 2000, in 2020, it has an increase of total waste treatment through recycling (29%), through Incineration (waste to energy or not) in 25%, and through composting (17%).

Incineration and energy recovery are crucial parts of waste management in many Member States, including Finland, Sweden, and Denmark, where between 34% and 52% of domestically generated waste was incinerated in 2020. Because of the significant amount of wood waste in Finland, incineration is particularly high.[7]

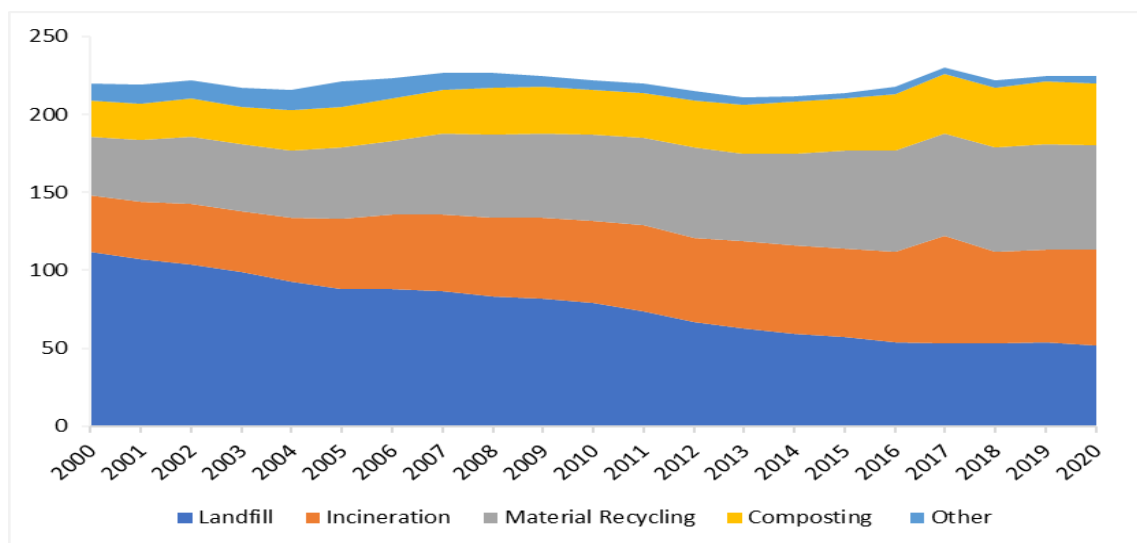


Figure 1: Waste treatment, 2000-2020 in EU, (in million tonnes)

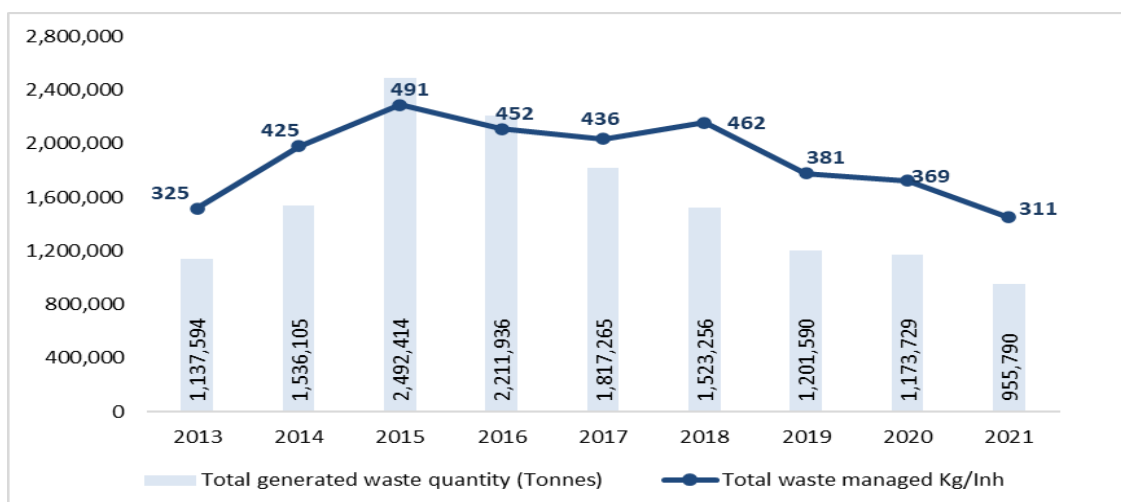
Source: [6]

Waste Management in Albania through PPP models. Incinerator Case

The concept of circular economy is a relatively new concept used in Albania. The Circular Economy was mentioned for the first time in the country's strategic documents, in the Strategic Policy Document and the National Integrated Waste Management Plan 2020-2035. This document aims to move from the linear economy to the circular economy with the aim of the efficient use of natural resources, encouraging the reduction of waste generation and the reuse of recyclable materials to mitigate the negative impact on the environment.[8]

However, our society, businesses or the government are still not clear on the meaning of this concept and how these actors can really contribute to the transition to the circular economy.

One of the most worrying issues in Albania is urban waste management. According to [9] for the year 2021, it turns out that around 875,105 thousand tonnes of urban waste have been managed. The annual amount of urban waste managed per inhabitant, on a national scale, in 2021 is 311 kg/inhabitant, from 369 kg/inhabitant in the previous year.

Figure 2: Total urban solid waste in Albania, 2013-2021

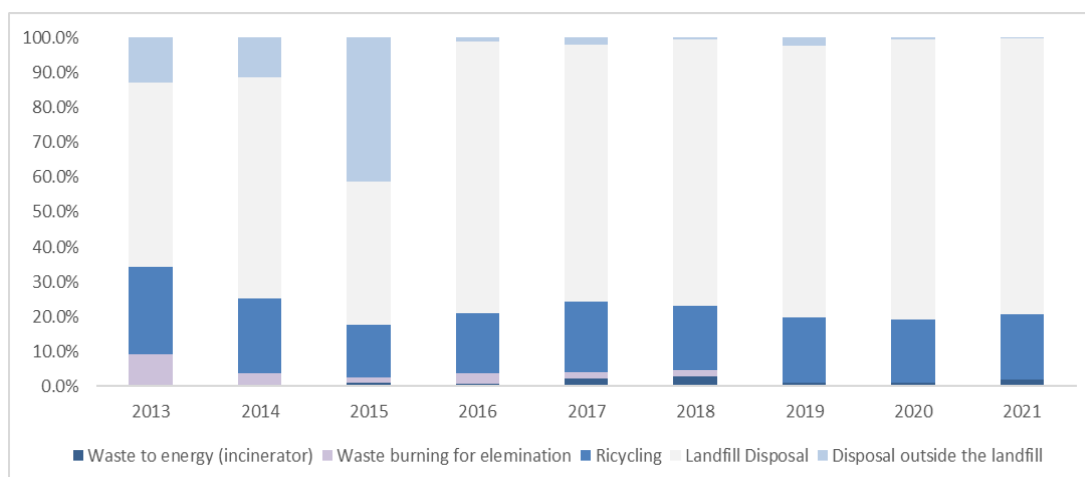
Source: [9]

In Albania, the main methods used for waste management are landfill disposal and illegal dumping [10]. In 2021, about 79% of the total amount of waste was deposited in landfills and waste fields, while in 2020, 80.2% were deposited, marking a decrease of about 1.2% of the total amount of deposits in landfills and waste fields approved as temporary deposits by the respective municipalities. The decreasing trend is a result of an improvement in the quality of data and a better understanding of the municipal waste data reporting, and it cannot be interpreted as a reducing trend per se. [10]

As it is show in Figure 3, the most common types of waste treatment are landfill disposal, waste incineration for elimination and waste to energy incineration. According to [9] during the 2021, 18.8% of the total amount of waste was recycled, while last year this indicator was 18.1%. The waste recycling has maintained approximately the same level of indicators with a downward trend.

Also, in this year about 2% of the total amount of waste was treated with burning in an incinerator for elimination and energy purposes, marking an increase in this indicator by 0.9%, compared to the same indicator in 2020. [9]

According to [10], in Albania there are 9,046 reported illegal landfill dumpsites of which only 6% are cleaned. Landfills that are managed are situated at sites in Sharra, Bushat, Bajkaj, Maliq, and Elbasan. The first incineration plant in Albania commenced operation in 2019 (Incinerator of Elbasan) and the incineration data for 2013-2018 are related to illegal burning of waste at landfills [11].

Figure 3: Urban waste treatment, 2013-2021 (% of total waste)

Source: [9]

Since 2015, waste management in Albania is organized according to the Law on Local Self-Government 135/2015 by the Municipalities, each according to its own decision-making, based on local plans and local budgets. According to the current legal framework, Albania is committed to meeting EU goals by 2025 at the least, in line with the circular economy. The targets for increasing recycling and reducing landfilling require the development of key infrastructure for the waste treatment. In order to achieve this target, Albania will need to devote a lot of time to the prevention, material recovery for reuse, and recycling processes if it wants to increase recycling from its current level of 18.8% to 50% by the year 2035. To achieve this, unique plans must be developed, and a highly effective partnership between citizens, municipalities, and businesses must be established. [8]

Through this commitment, Albania will start negotiations with the EU, especially chapter 27 on the environment, showing and how these targets will be achieved and the path that Albania will follow to become a member of the EU as soon as possible and fulfilling the relevant obligations.

In the last decade, three public-private partnership contracts have been concluded with the aim of waste management and energy production, [12] :

PPP Contract on “Landfilling, construction, incinerator and rehabilitation of existing Tirana landfills” concluded on 31.08.2017 between the Ministry of Environment (today under the jurisdiction of the Ministry of Infrastructure and Energy) and the Integrated Energy BV SPV company, with a duration of 30 years, until 2047. Incinerator of Tirana is the largest Public Private Partnership contract for waste management in Albania, with a processing capacity of around 550-800 tonnes per day, but the private company has not built yet the plant, so actually the total waste of Municipal of Tirana are landfilling or burning for elimination.

Table 1: Descriptive data of PPP project on Waste Management to Energy

Project PPP	Investment	Value	Does	Incinerator	plant
Incinerator of Tirana	124,248,330		No		
Incinerator of Elbasan	21,661,400		Yes, since 2021		
Incinerator of Fier District	27,360,000		Yes, since 2019		

Source: [12],[13]

Another PPP contract is “Construction, operation and transfer of the incinerator for the processing of urban waste of the Municipality of Elbasan”, concluded on December 16, 2014 between the Ministry of Environment (today under the jurisdiction of the Ministry of Infrastructure and Energy) and the company Albtek Energy sh.p.k. The Incinerator of Elbasan is in function actually and the amount of waste recovered per year provided in the contract is 43,200 tonnes per year. For the 2021 year, the total waste managed in this Incinerator is 41,518 tons. As a result of waste incineration, for the period January- August 2022, due to this process it is produced 6,792 MWh electrical energy. [14]

The PPP Contract “Construction, Operation and Transfer of the incinerator for the processing of urban waste of the Municipality of Fier” was concluded on October 24, 2016 between the Ministry of Environment (today under the Jurisdiction of the Ministry of Infrastructure and Energy) and the company Integrated Technology Waste Treatment Fier sh.p.k, for a period of six year, with a processing capacity of around 180-200 tonnes per day. The Fier incinerator plant became operational in second semi-annual in 2021, however there is no published data regarding waste management in this incinerator.

According to the [8],[15] National Strategy of Waste Management (2020-2035) estimates that the combustible potential for the waste generated in Elbasan, Fier, and Tirana is only 26% (or 123,000 tonnes) of the projected capacity of these incinerators.

Regardless of their high cost in the budget state (about 93 million Euro in total for 2015-2021 [13]), the capacity of the incinerators built does not manage all the generated waste, making this method ineffective. [8],[15],[16]. Also, [10], shows that new incinerators in Albania, can have serious implications for public health and the environment, are built without being in compliance with EU acquis related to waste, including the waste hierarchy principles and circular economy.

Furthermore, the selection of this method for waste management is not recommended by the European Union Directives. In the Progress Reports from 2018 to 2022, in Chapter 27, it is emphasized that although Albania has made little progress in the transposition of the directives, the state must be careful with waste management and more specifically with the incineration method. The Commission emphasized that Albania should increase collection separation by preventing waste development, encouraging recycling, and minimizing waste.[15]

Conclusion

As it is highlighted throughout this paper, the circular economy concept in Albania is still at an early stage. Strategic Policy Document and the National Integrated Waste Management Plan 2020-2035, aims to move from the linear economy to the circular economy using natural resources in more efficient way, increasing recycling and reducing landfilling.

In 2021, about 79% of the total amount of waste was deposited in landfills and waste fields, while in 2020, 80.2% were deposited, marking a decrease of about 1.2% of the total amount of deposits in landfills. The most common types of waste treatment are landfill disposal, waste incineration for elimination and waste to energy incineration. The waste recycling has maintained approximately the same level of indicators (18.8% of the total amount of waste for 2021).

Also, in this year about 2% of the total amount of waste was treated with burning in an incinerator for elimination and energy purposes, marking an increase in this indicator by 0.9%, compared to the same indicator in 2020.

For Albania, using incinerators to manage waste has not result effective, and actually their capacity does not account for all the waste produced. This approach has also shown to be costly for the state budget and noncompliant with European waste management directives.

The waste hierarchy clearly states that recycling should be preferred over waste incineration and deviations from the waste hierarchy must be justified only if this method lead to higher socio- economic and environmental benefits.

To be consistent with the principles of the circular economy, Albania should aim to implement greener options than waste incineration, such as recycling and composting.

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Ambidexterity for Innovation in Albanian Public Sector

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Abstract

Coming as an ever-going concern of both private and public sector scholars how innovation is received, the ambidexterity of public officials for new technologies or their resistance towards it makes a big difference not only on their approach to the public, but to the very citizens they aim to serve and help. General accepted opinions coming from some research shows the sluggish adoption of new platforms in the public sector almost always lagging their private counterparts.

This paper focuses on the adoption of new technologies in Albanian public sector and checks if the main scholar reviews hold true for Albanian state agencies. Platforms such as all-encompassing E-Albania are put to test whether the public officials are truly lagging in adoption or going faster than even their respective citizens in the adoption of online services offered in most of the state agencies. Extensive research in the field will inevitably bring a comparative outlook with similar or distant countries in this particular technologies adoption norm.

Introduction

In the last decades, there has been an increased interest in studies that address the problems of the public sector. The scope and impact of public services are much wider than those of services provided by the private sector. At the same time, technological progress and digital transformation in the private sector are creating pressures for the public sector to innovate and meet the growing expectations of citizens. For example, the Amsterdam Smart City project transformed urban management through innovation that integrated information technology (IT) with Amsterdam city services. Although the public sector can be attributed significant innovative advances, the latter has often been seen as conservative and bureaucratic (Bloch & Bugge, 2013). Most previous research on innovation has focused on the private sector, although recently there has been an increasing focus on public sector innovation.

Previous studies have identified two types of innovations: exploitative innovations, which improve existing competencies, and exploratory innovations, which create new products, services and processes. Similar to the expectations of private organizations, public sector organizations today are increasingly expected to strike a balance between exploitative innovations to achieve efficiency in the delivery of citizen services and exploratory innovations in order to develop innovative products and services. The need for organizations to balance

these two types of innovation has been highlighted by research and known as organizational flexibility or ambidexterity (Jansen et al., 2006). A major obstacle to achieving ambidexterity is the lack of adequate resources to devote to the simultaneous pursuit of conflicting goals.

While this limitation has received much attention in the literature (Agarwal et al., 2017), a variety of other limitations may also present challenges to achieving ambidexterity (Lin et al., 2007). Public sector organizations may face internal, external and network constraints beyond traditional resource constraints (Tate et al., 2018). Organizational culture, organizational structures, and competing priorities of organizational units, among other elements, may present constraints on the pursuit of organizational ambidexterity. For example, the existence of an overarching structure organized in a federated form, which is very common in public sector organizations, presents a unique limitation. A federation is an organization model that includes multiple organizational units, each with its own independent structure, mission, and culture. The federated organization is not a centralized entity, but a looser collection of autonomous units, each with fundamentally different functions. The mechanisms required to develop dual capabilities under these constraints are still underexplored.

On the other hand, in order to reduce this problem, comprehensive platforms have emerged. Platforms have emerged as key components in organizations' applications as innovation propositions. Platforms are defined as sets of core assets that meet the common needs of a core set of customers while providing flexibility, adaptability and extensibility to meet unique needs. Previous studies have claimed that industry platforms drive innovation. However, the way in which this approach unfolds in public sector organizations remains largely unexplored and understudied. This leads us to the following research question: How do public organizations use platform-based approaches to develop ambidexterity in balancing exploitative and exploratory innovations?

Organizational Ambidexterity

Organizational ambidexterity refers to the ability to pursue conflicting goals at the same time or, more broadly, the ability to balance different activities in a compromise situation. Research has proven that eliminating conflicting demands is often not realistic, so developing appropriate processes that help balance conflicting demands is an important driver of success for organizations. Previous research has extensively examined how conflicts, such as those between exploitation and exploration as well as the conflict between flexibility versus efficiency (Adler et al., 1999), can be managed. Exploitative innovation exploits existing models through small changes.

These changes are incremental and designed to meet the needs of existing customers or markets. They extend existing knowledge and skills, improve established designs, expand existing products and services, and increase the efficiency of existing distribution channels. Therefore, exploitative innovations build on existing knowledge and reinforce existing skills, processes and structures (Benner & Tushman, 2002). Conversely, exploratory innovation is

based on new sets of principles that can result in redefining an industry (Benner & Tushman, 2003; Danneels, 2002). They offer new designs, create new markets and develop new distribution channels. Exploratory innovations require new knowledge or departures in procedures that currently exist (Levinthal and Marsi, 1993; McGrath, 2001).

Previous work on organizational ambidexterity provides a detailed understanding of the conflicts that organizations face, their antecedents, and the consequences of the strategies developed to address them. Behavioral integration involves merging conflicting activities into a single unit and supporting individuals in balancing their time between exploitative and exploratory tasks. Research on organizational ambidexterity in the public sector is quite new (Cannaerts et al., 2016). It underlines the trend towards innovations in public management, effective use of resources and communication with stakeholders (Smith & Umans, 2015).

Platforms

Early literature used the term "platform" to refer to a software environment with an extended code base that provides essential functions and can be adapted to provide specific functionalities for different market segments (Fichman, 2004). This has evolved into the notion of the platform ecosystem. Platform ecosystems often bring together like-minded developers who develop new functionality around an existing platform. Previous research on platform ecosystems has focused on technology- and market-oriented aspects of how platforms are developed and used (Sutherland & Jarrahi, 2018).

Platforms are categorized into two types based on their applications and costs: internal and external (Porch, Timbrell et al., 2015). Internal platforms focus on a set of assets organized into a common structure within an organization. Platforms are used to produce variants of a product family by reusing core platform assets. External platforms cross organizational boundaries and provide the structure needed to support the expansion of opportunities from third parties.

The stream of research focusing on internal platforms tends to examine various aspects of platform development, including platform architecture, the structure of platform teams that include domain and application engineering, a balance between commonality and variability, and the role of delayed design decisions. This is strongly engineering-based, supported by new product development and focusing on the development of related product families that share a platform.

Work that examines modularity and extensibility, which are factors of central interest to the literature on internal platforms, and relates them to market performance, which is an important area of focus for external platforms. The literature on external platforms has also been aware of the great role of such platforms in fostering innovations (Wan et al., 2017), especially innovations that the platform developers do not foresee from the beginning but which are related to ambidexterity organizational with platform strategy by examining five critical defining categories: price, openness, integration, differentiation and coverage.

Issues examined in these categories may include factors relevant to both internal and external platforms. This is important from a technology management perspective. We argue that drawing from both streams of platform research is valuable and that there is considerable complementarity in the implications drawn from both fields. This is particularly true for our study, in which we examined the role of platform-based approaches in balancing exploratory and exploitative innovations in public sector organizations.

Innovation in Public Sector

Innovation is defined as the creation of a product, service or process that is new to a business unit. Innovations have been classified in different ways: technical skills vs. organizational knowledge skills (Abernathy & Clark, 1985), supportive vs. disruptive (Bower & Christensen, 1995), process vs. product focused, etc. Past literature has also examined differences in how organizations manage innovation under different conditions of environmental dynamism and competition.

Innovation in the public sector refers to a change that is relevant to the operations of an organization rather than a change that is new in the context of competition with other organizations. It includes service and product delivery innovation, administrative and organizational innovation, conceptual innovation, policy innovation and systemic innovation (Koch & Hauknes, 2005). These authors have identified three forms of value creation in the public sector which are: (a) increasing efficiency, quality and user satisfaction with the services provided; (b) social outcomes, such as quality and safety; AND

(c) trust.

Public organizations operate under significant constraints that hinder their ability to innovate (Tate et al., 2018). Furthermore, the opportunities and barriers to innovation in the public sector are significantly different from those in the private sector. Public organizations are often seen as conservative and bureaucratic (Bason, 2018), and fear of risk or failure is often a major barrier to innovation. Private sector firms must take risks in order to thrive or even survive in a competitive environment, while public sector organizations have less to gain by taking risks and less to lose by not taking them.

Furthermore, intense scrutiny from the media and political opposition can magnify the impacts of unsuccessful innovations in the public sector, thereby increasing risk aversion (Borins, 2001). Research on innovation in the public sector has examined networked governance (Hartley, 2005), community governance (Hess & Adams, 2007), and collaborative innovation (Sørensen & Torfing, 2011), which is primarily oriented toward achieving social outcomes. . It is argued that the public sector should engage in both creative and exploitative growth.

The Study

This research investigates how organizations achieve ambidexterity by balancing different types of innovations using platform-based approaches. Although there is extensive literature on how organizations achieve ambidexterity and how platforms can be adopted to suit different

market needs, there is a lack of knowledge conceptualizing how platform-based approaches help public sector organizations achieve ambidexterity. Therefore, we used an exploratory case study approach and an inductive design to help build theory. The case study approach provides insight into a phenomenon by examining it in real-world settings.

We used theoretical sampling to select a well-known public sector platform that was needed to manage conflicts in the implementation of exploitative and exploratory innovations. The chosen site is E-Albania. E-Albania is engaged in balancing different types of innovations using platform-based approaches, thus providing a fertile environment for study.

The organization has an annual budget of 4,163,023 lek in 2022 and 3,712,867 lek in 2021 with a 12% increase in the 2021 budget based on the growth and importance that E-Albania has taken on e-Government. This platform has taken on a great importance in the national strategy of digital development and the replacement of government service counters with online counters, which is based on the Digital Agenda of Albania 2015-2020 and continues with an ever-increasing budget and services. The budget used for E-governance or E-Albania, the largest platform of the package, is for the year 2022 1.26% of all national budget expenditures.

E-Albania is connected to the Government Platform of Interaction, which has 48 connected systems that exchange data in real time. It is available 24 hours a day, seven days a week, all days of the year. The services that this platform offers are in accordance with UNPAN levels 1-2-3 and 4 of the United Nations. All kinds of applications can be made there, various certificates and registrations can be obtained in different state agencies. There are solutions for individuals and businesses by making a direct connection with the National Business Register (NBR).

The platform interaction system is based on an Enterprise Service Bus solution with a service-oriented architecture. The platform also works with private sector innovation communities to leverage this ecosystem for government applications, co-invest in ideas and accelerate time-to-market. E-albania has a unique organizational structure; the units have a long history in public service, while the headquarters is much newer. The organization is also unique in that units require widely different areas of expertise, technologies, innovations and processes based on their different priorities. However, platform involvement is a coherent common point across all units that can be used to leverage the needs of these units.

Data were collected mainly through semi-structured interviews. During face-to-face interviews, we focused on innovation initiatives to gain a comprehensive understanding of how constraints were overcome, particularly in terms of developing and adopting different platforms. Based on the informants' initial responses, we asked follow-up questions that revealed more details about their approach to innovation.

All the respondents who accepted and responded are widely involved in decision-making. In the study and from the interviews, it was possible to obtain many points of view which in a way converge towards three main approaches or methods of how the public sector can pursue innovation: traditional public administration which is updated with new innovations, new public management composed from the same services but also services and procedures that are adapted to technology and mainly the way individuals request the service, and finally e-government or network government, which is the provision of a greater part or all of the service

requested online without physical contact between the government employee and the individual.

In this finding, the relationships between the characteristics of the innovation, the characteristics of the manager who is responsible for this application and the adoption of the innovation in public sector organizations were also identified. One of the methods used by visionary and tech-accepting managers or leaders was to propose collaborative innovation to solve the problem caused by bureaucratic (closed) forms of innovation by opening the innovation cycle to a variety of actors.

In the interviews that were also conducted, care was taken that they were distributed as widely as possible, starting from the sectoral and geographical analysis that was done for the extension of platforms integrated into the service, according to the cities, offices and positions that emerged from the analysis and data. The main goal was to understand how adaptation, employee training and platform adoption helped E-Albania achieve ambidexterity between exploitative and exploratory innovations. A good part of the budget employees who were interviewed, regardless of the management level they held, also had previous experience in the private sector.

It was also noticed that at the levels of managers who are high in the hierarchy, there is a rejecting or more precisely limiting concept which is rationalized by the lack of sufficient time to focus on innovations and new things, and this justification is true in most of the cases. One of the limitations that became an obstacle to a certain point was the inconsistency that arises as a natural conflict between the rules and clear limitations in these types of structures against the invocation and the culture of openness and information sharing. It is understood that government employees and the companies that serve them have a preference for the first.

A real concern and source of conflict is the untrustworthiness of the public in online platforms, due to privacy concerns. Based on this, we can also mention the cyber attack on the platform in 2022 where it managed to get data from users and disrupt the systems for weeks as well as the coordination between the platforms. The care and concern of citizens is well understood, but the government and its agencies are taking important steps by investing in security systems and making them safer.

Another area where E-government works is the adaptation of user interfaces to be easily usable even by the second and third ages, who are not very skilled in using new technologies. This data was confirmed by the interviews and it was said that the help of the best private companies that can create suitable interfaces to overcome this problem has also been requested.

Innovation in the public sector is limited by various factors. Practices that are effective for innovation in the private sector may not work in the public sector because of these limitations. The findings of this study suggest that public sector organizations will benefit from adopting

platform-based approaches to ambidexterity for innovation. While this study is based on the case of a public organization, we hypothesize that practitioners in large and established private organizations facing similar constraints may also follow a similar approach to achieve innovation ambidexterity.

Conclusions and Recommendations

Considering that ambidexterity and openness to innovation is a challenge not only in the public sector, which is the subject of this study, but also in the private sector, there is a need from high-level managers for a complete analysis of the limitations and their impacts on innovations.

It was seen that there is an embrace at a very satisfactory level of innovation as well as a success in the integration of platforms which have been united in a single program which can be easily used by computer and phone. The use of the platform is suitable for all ages, although with reasonable restrictions for the second and third ages. One of the things that users are concerned about is the security of the data they provide, for this reason there is a reluctance and a moral compass that worries government employees, slowing them down in accepting and embracing new technologies and in their ambidexterity.

The exploitative and exploratory innovation was in line with previous studies conducted in countries similar to Albania. Understanding the shared and unique needs of different entities is essential to developing a platform-based approach to balance exploitative and exploratory innovations. Practices must be adopted by management levels to balance control and flexibility in platform adoption.

Also, private innovative service providers can play a supporting role in innovation through different mechanisms by training or providing their services to state institutions.

This study is part of a broader study done regarding innovation in the public sector with a focus on new platforms and more complete studies could also focus on the effectiveness and employee acceptability of these innovations.

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The Impact of Employee Education on Sustainable Development Strategies in the EU

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Abstract

The notion of sustainable development emerged due to an increased concern about the impact of human society on the natural environment. The Bruntland Commission developed and defined the concept of sustainable development in 1987. According to the commission, sustainable development is one that meets present needs without compromising the ability of the next generation to meet their own needs. Sustainability development ensures that even though development is necessary to improve the quality of life and meet human needs it must happen without dwindling the capacity of nature to meet present and future needs (Nevin, 2008). Therefore, creating awareness of sustainable development ensures that the population understands the impact of climate change on the environment.

Educating employees on the importance of sustainable development creates a positive impact on the organization and its environment. Companies must take part in sustainable development programs and projects to encourage employees to have a greener corporate culture that meets the needs of the present while protecting the future. The United Nations and the EU have common goals for a sustainable future. The EU supports the concept of effective multilateralism, in which educating employees helps in creating awareness (European Commission, 2022). Educating employees in understanding the mission of the EU and United Nations contributes to shaping a safer and better world for everyone. Sustainable development goals are the essential catalyst for projecting the EU's objectives and values by providing a shared framework with different organizations. The current study focuses on exploring the impact of educating employees on sustainable development strategies. Employee education on sustainable development strategies improves a green corporate culture that benefits humans and nature in the present and future.

Keywords: Employee education, development, sustainability, strategy, green corporate.

Background information

Environmental policies promote social inclusion and job-creating in the EU. Developing environmental policies from a local and international level creates a positive impact on the overall population at the workplace. The new policies developed in the EU support the development and the usage of new environmental technologies. Technological initiatives taken up by the EU, such as Environmental Technologies Action Plan and the Trading Scheme enhance sustainable development. The main agenda of the European Commission is to promote upward convergence and reduce inequalities. There is clarity between the quality of the environment and social inclusion. Currently, Europe's poorest population suffers from

pollution, which means they can gain from environmental improvements. Other essential factors such as health, quality of jobs, and safety at work create a link to sustainable development. To curb the impact of pollution and inequalities in the environment, the EU applies environmental policies. These environmental policies contribute to workplace objectives while promoting environmental sustainability. Attaining the environmental and employment objectives in line with the global sustainable development is a win for both parties. The organizations benefit particularly from the appeal to the highly conscious consumers in the current market, who prefer to deal with firms that have their best interests at heart. In this case, the objective is to align the goals of each party to fit the sustainability aspect, while ensuring mutual benefits through incentives. Therefore, the EU's strategy to meet environmental and employment objectives can be achieved through employee education.

In November 2005, the European Commission reported that the EU's sustainable development strategies that outline the social, economic, and environmental policies reinforce and complement each other. According to the report, productivity and employment have a positive impact on economic growth while building a sustainable Europe. In 2015, the SDG principle focused on living no one behind. The agenda for the 17 Sustainable Development Goals stresses the holistic approach to inclusivity to achieve sustainable development for everyone (United Nations, 2020). To achieve the objective EU proposes raising awareness of the 2030 Agenda. Organizations, institutions, and the government engage in promoting a sustainable Europe through working with the United Nations. Therefore, meeting the sustainable goals in Europe requires a broad concept of the role employees plays in achieving sustainable development. Many organizations in the EU are adopting environmental policies that impact corporate greener culture.

Justification of the study

The positive impact of environmental education and employee awareness training is important to the development of a new organizational culture. Awareness and education lead to sustainable development and allow employees to adapt and learn new and green ideas, attitudes, and skills (Stringer, 2009). Education on sustainability is an essential tool that engages employees in management, corporate risk, and operation while encouraging employees to make responsible environmental decisions at the workplace (Abid, 2013). Training employees and encouraging sustainability-related competence are essential in improving corporate initiatives on improving employee performance. Without employee support and commitment, it can be difficult to achieve the sustainable goal in the EU. Therefore, conducting the current research creates awareness of the positive effect of engaging employees and training them on sustainable measures.

Research objectives

- To assess the link between the environment and employment in achieving sustainable goals
- To understand the impact of educating employees on sustainable goals

Research question

What is the impact of educating employees on sustainability goals in the EU?

How employment and environment are improved sustainability and employment?

Literature Review

The global environment is comparatively important to the economic growth in developed and developing countries. People in developed and developing countries can achieve sustainability through sustainable farming. Prioritizing on economic growth over protecting the global environment is reading the priorities upside down because for economic growth to occur there must be an environment in which activities fueling the growth are taking place. Economic growth can only mean so much as long as the environment that sustains the life that the growth is meant for is protected. The developing countries cannot experience any growth if there is no environment to develop.

Topography, weather, and wind influence air pollution greatly. They affect the dispersion of air pollutants. If there is great wind, pollutants disperse more, if the air is humid, the pollutants do not disperse faster and mountainous regions experience lower levels of air mixing with pollutants due to the geographical nature of the regions. There would be an increase in the rate of employment and it is a more efficient way of mining. The method however can cause pollution of underground water and it needs quite a large amount of water to mine and may pose health challenges to some people. Most impacts will be on the local scale. These include the possibility of residents shifting to other areas and the health effects, the contamination of water will largely affect the locals. The only impact that could have a wider scale is the possibility of an earthquake which is listed as one of the likely effects of fracking.

The biodiversity of the local area has a variety of living things, from plants to animals. The natural vegetation indigenous and the animals aside from the humans and domesticated animals are many insects and birds. The three major threats to biodiversity are recreation, fragmentation of ecosystems by roads and other linear corridors, and depleted resources. Most of these threats are not being addressed as they are viewed to be of prime importance, but on the issue of depleted resources, environmentalists in conjunction with the states are keen on conserving the resources that are at risk of depletion.

Sustainable Development Goals (SDGs) 2015 have its sixth goal of ensuring availability and sustainable management of water and sanitation for all. The United Nations elaborates the goal to include accessibility, availability, and sustainability of the resource. It also talks about protecting water from exploitation and its conservation. According to SDG 2015, the number of people who have access to safe and clean drinking water in developed countries has risen from 30% in 1970 to 70% in 1990, and a further improvement to 84% in 2014 (United Nations, 2020). However, these statistics seem not to match the real situation on the ground or it could be that the population that has got no access is a substantial percentage that needs urgent solutions to guarantee them this precious need that is important to their sustenance.

Water is an essential sustainability goal. Water pollution is a common tragedy because, despite the looming danger of its depletion as a resource, humans continually exploit it rather than conserve it. A perfect case of how humans exploit the resource is when companies who use water in large quantities for commercial purposes do nothing to ensure the continued existence of the resource by recycling or applying environmental practices that ensure water sustenance such as afforestation. It would be harder to achieve water sustainability. The individuality of

rights overrides community needs and thus the good that is water would be distributed at the will of the individual regardless of the societal pressures requiring the individual to avail of the resource.

For sustainability to be established, privatization of natural resources such as water must be stopped as climatic changes might cause stress to a bigger population causing ecological and economic imbalances. Climatic changes would ultimately cause fewer water sources causing living beings to consume artificial water. The crisis in water supply has an impact on many nations as most sources of water dwindle due to lower water tables and globalization. Therefore, there must be a system whereby water is controlled not by the private sector but by all human beings. Poor people are mostly affected by the supply chain since they get minimum supply or have to struggle to acquire alternative sources of water, which might pose to be a challenge.

Changing government policy would be feasible in the long run. Resistance to this change is certainly inevitable but the policy will be adhered to when the laws are in place. However, the love for cars in our society is great so much that there needs to be an alternative to parting with them, like creating more sustainable cars. This is not to say however that building a public transport system is not feasible. The best and most feasible way to combat environmental issues is through a collective approach by all the global citizens, each enjoying an equal stake.

One of the benefits of the ecological footprint method does not just give an abstract variable as the actual size of the land is required to sustain a population. It can measure the real impact that our consumption habits have on land and the seas. The concept, however, has been hypothetical in the calculation of impact, failing to distinguish between sustainable and unsustainable land use. It would be unfair to restrict the growth of developing countries because of climate change. However, what should be done is the application of sustainable ways of spurring such growth without the growth having any negative effects on the environment. This can be done by the use of clean energy and regulation of carbon dioxide, methane and nitrous oxide emissions to the atmosphere to control climate change.

Sustainable development at the workplace ensures that employees work towards the sustainability goals and apply strategies that improve current and future wellbeing. Approximately 85% of employees feel like they do not reach their potential at work and are disengaged (Burton, 2019). Providing growth opportunities to employees create a positive impact on their well-being. Similarly, enhancing sustainable behavior indirectly impacts employee wellbeing (Burton, 2019). For instance, encouraging sustainable travel such as cycling and walking reduces stress, improves health, and decreases air pollution. Therefore, decreasing the risk of dependence on oil and gases educates employees on the importance of a greener economy.

The United Nations declared 2005-2014 as the decade for Education for Sustainable Development which encouraged innovative approaches in formal and informal education to contribute to societal change. Education for Sustainable Development involves adopting a holistic approach to learning to create a better future. The process of development has become dependent on the exploitation of natural resources. The replenishment of these natural resources prevents people from living sustainable lifestyles. Education has sought to

incorporate some of the challenges that prevent this, such as climate change to change the people's attitudes and encourage moderate use of natural resources.

Businesses also affect the environment and society, implying that businesses need a sustainability strategy. Education plays a vital role in changing people's attitudes towards the depletion of natural resources and forming business strategies that encourage sustainability.

Education for Sustainable Development traverses the traditional way of teaching by adopting a more holistic approach. Key environmental challenges like climate change need to be incorporated into subjects like math, science, and art and modifying the teaching-learning process to a more all-encompassing approach (Nayar, 2013). Climate change greatly affects people's lives, as seen in low crop yields from global warming. Educating students on these matters encourages sustainability by transforming lives in a way that does not impact their current routines (Nayar, 2013). Sustainability initiatives help to drive social and environmental change. In addition, they contribute to an organization's overall success (Chladek, 2019). In the ever-evolving world, Education for Sustainable Development will help future organization leaders to incorporate sustainability initiatives into their business strategies.

As a result, these businesses will mitigate the negative effects that they will have on their environment. UNESCO's education sector is responding to the dramatic challenges that the planet is facing by adopting education for sustainable development. Human activities have altered the earth's ecosystems in a way that continues to threaten the survival of human beings (UNESCO, n.d). As such, efforts are necessary to contain issues, such as global warming before it reaches catastrophic levels. There have been efforts to address environmental, social, and economic issues holistically through education (UNESCO, n.d). Schools no longer function in isolation, which has allowed students to integrate with the world outside and appreciate what the planet offers. These students will respect the need to use resources efficiently and responsibly. Educators need to integrate the concept of ESD to help people learn to think and work towards a livable world (Kumar & Mohapatra, 2021).

A livable world encourages progress in every aspect of society.

Higher Education is also a vital instrument in achieving sustainable development. Quality education should be oriented towards the values and skills of sustainability (Kumar & Mohapatra, 2021). Higher education institutions must conform to the paradigm shift to allow for a sustainable future. The university is an information and learning organization that encourages graduates to adopt sustainability strategies in their business ventures (Kumar & Mohapatra, 2021). These graduates will consequently realize the benefits of sustainability in business, including protecting their brand and mitigating risks. Improper practices damage an organization's reputation and cost them, customers. Companies involved in oil spills or scandals resulting from forcing employees to work in unsafe conditions damage their brand and their competitiveness in the market. Sustainable strategies that protect the environment and workers protect the company from damaging incidents. These sustainable strategies should be learned in educational institutions, especially institutes of higher learning.

Environmental education has helped shape a sustainable future in many ways since its adoption. One evident example is an Eco-School in the UAE that was awarded the Green Flag, which symbolizes excellence in environmental performance (Nayar, 2013). Students from this school saw the need for more wall space to spread environmental awareness messages and

created a huge mobile wall of cartons which saved school funds and reduced the amount of waste produced in their school (Nayar, 2013). ESD, therefore, creates an opportunity for students to spread awareness on matters concerning environmental change and what impacts it brings to society. This awareness allows organizations to further implement sustainable business strategies. Research carried out in schools will help identify the effects of the depletion of natural resources in various parts of the world. By understanding these effects, organizations can realize the appropriateness of sustainable business strategies. ESD provides information about being environmentally friendly and allows for the development of life skills critical to any organization. These life skills include leadership, communication, and management essential for personal development (Nayar, 2013). These life skills are vital to the success of any organization. Organizations should have efficient leaders who understand how to communicate with and manage their employees. Young people should be equipped with these relevant capabilities and their environmental knowledge to ensure that they positively impact other members of society. These young individuals will have the ability to think innovatively to make maximum use of available and reusable resources. They will also be able to implement these ideas in business strategies that their future organizations will adopt. These efforts will result in personal development and further humanity by respecting the planet's resources. Education for sustainable development also includes promoting the issues of gender equality and human rights. These issues are critical to sustaining a livable world. Organizations are increasingly seeing the need to include policies that promote gender equality and human rights (Chladek, 2019). An efficient organization needs to incorporate policies that make it a suitable environment. An organization with this environment can better satisfy its employees and boost productivity. Employees will be more inclined to achieve their goals and focus on more than just profits (Chladek, 2019). The competitiveness of such an organization remains unmatched in an increasingly complex market. Creating an environment that allows workers to thrive automatically gives it an advantage in employee recruitment and retention. Talent is more attracted to organizations with sustainable practices. However, organizations cannot adopt these sustainable practices without receiving education for sustainable development.

Graduates leave universities to enter a world full of uncertainty, complexity, and rapid change. The global issues they have to tackle include economic instability, inequity, and loss of biodiversity (Sterling, 2014). To handle these issues, there needs to be a broad movement concerned with identifying and advancing the kinds of education, teaching, and learning policies that promote sustainable development. Relevant learning among all stakeholders is central to the process (Sterling, 2014). The quality of the future depends on the ability of people to learn and change. Education is a significant factor in making the world more sustainable. The importance of this is in how organizations have become purpose-driven. Companies will be more infused on their business goals and encourage a skilled workforce that results in the financial success that boosts the economy. People are more likely to recommend a company with a strong purpose to other people. Education for sustainable development has resulted in a growing market for sustainable goods. As of 2019, 73% of global consumers were willing to switch their consumption habits to lessen negative impacts on the environment (Chladek, 2019). It would be logical to assume that the numbers have increased since then. This aspect means that ESD has been effective in creating positive awareness. The awareness has also helped companies cater to the growing market for sustainable goods. Millennials are even willing to pay more for products that contain sustainable ingredients and products (Chladek,

2019). Organizations have committed to sustainable products and practices with this realization. While some might consider this beneficial to the company's finances, these implementations have ensured that products have social responsibility claims. Organizations have also achieved to convert sustainability-minded customers on top of increasing sales. In this way, education for sustainable development has affected change in a meaningful way. Education for sustainable development has resulted in people recognizing the need to promote issues such as gender equality and human rights while also helping people to understand the need to mitigate the negative impacts of climate change. ESD also promotes life skills such as leadership, communication, and management. These life skills have been crucial to the success of organizations across the world. Moreover, they have helped organizations adapt to the growing market for sustainable goods. In selling products with social responsibility claims, they have also converted sustainability-minded customers. There has also been an increased number of eco-schools across the globe. These schools educate young people on the importance of practices that prevent the depletion of natural resources. UNESCO's initiative to introduce education for sustainable development has effectively reduced harm to the environment and promoted human rights.

Methodology

The current study deploys a qualitative approach to investigate the relationship between employee education and sustainable development in the EU. According to Bryman and Bell (2011), qualitative research is commonly used to evaluate studies in social and behavioral sciences. The qualitative method helps in understanding human nature and behavior. The research method is subjective and does not need the application of numerical analysis in analyzing and interpreting collected data. This means that there is a positive connection with reality relative to corporate culture and the value of the environment and society. For the current study, a qualitative method is essential in expanding knowledge to understand ways in achieving sustainable development through employee education. The data collected is through published journals and books that explore environmental sustainability, employee training and productivity, pollution, environmental policies, and sustainable development with a focus on the EU. The collected information is analyzed through an epistemological research approach. The researcher intends to explore the most popular themes from journals that show the relationship between employee education in enhancing growth and development by applying sustainable strategies at the workplace. The study hypothesizes that employee education promotes sustainable development among employees when they apply sustainable strategies in the workplace and community. The research ensures reliability, validity, and credibility, by using sources that are within 10 years of publication. This process helps in creating a focus on the current issues affecting sustainability goals and the EU.

Article discussion

The article focuses on sustainable development strategies in the EU and some effective approaches that help achieve the goals set concerning this issue. The strategy explored looks into how the corporate/private sector and its respective organizations can positively contribute to sustainable development in the region. The specific approach explored is that of employee education programs centered on creating awareness and improving the ideals and practices of

organizational workers regarding sustainability. In discussing this issue, the article begins by highlighting crucial trends, concepts, and issues surrounding sustainability both as a concept and practice. It begins its analysis of the topic by first comprehensively discussing the natural environment and the crucial resources that this holds for human society and other species dependent on it for their survival. In addition, it highlights some of the negative impacts affecting the natural environment ranging from air to land, and water pollution. Overall, the key emphasis is placed on how the negative impact on the natural environment is a critical concern both in the EU and globally.

The article introduces the concept of sustainable development and its accompanying initiatives and strategies after highlighting the main problems of the natural environment and their origins. This concept can be described as an approach that allows the efficient use of existing natural resources so as not to compromise both present and future usage and needs regarding these resources. The objective of sustainable development is, therefore, the elimination of unnecessary wastage or damage of precious natural resources. In further discussing sustainable development, particularly in the context of the EU, the article introduces the EU's Sustainable Development Strategies and other initiatives, such as the UN's Sustainable Development Goals (SDGs) that have been introduced to raise the level of environmental sustainability both now and for oncoming periods. All of these initiatives are highlighted to show the growing importance of sustainable development.

After covering the challenges facing the natural environment and the current initiatives seeking to address these issues, the article moves to its core focus, which is establishing the impact that employee education/training will have on sustainability development, especially in the context of the EU. More specifically, the author(s) seek to answer two major questions, with the first being the impact of educating employees on sustainability goals and the outcomes of doing so within the context of the EU. A critical assessment of the major concepts in this topic ranging from sustainable development, employee training, and development concerning sustainable development to Environmental Education, are covered in the literature review. Additionally, the article identifies how education for sustainable development plays a critical role in achieving environmental sustainability goals, specifically by raising awareness and improving perceptions and practices regarding sustainability. Ultimately, the literature review concludes environmental/sustainability education results in positive outcomes based on greater awareness and practices by individuals and groups regarding the environment.

After providing sufficient information concerning the covered topic in the literature review, the article introduces its methodology and findings regarding the selected topic/subject matter. The author(s) point out that they utilized a qualitative approach when assessing the relationship between employee education and sustainable development in the EU. To further clarify the selected research methodology, the article examined existing publications from different sources, ranging from books and scientific journals to others that cover this topic. After doing so, the authors established sufficient findings which supported employee education as having a positive impact on sustainability development both within and outside the organizational context. Several reasons are provided that support why training employees on sustainable development is beneficial in both the immediate (organizational environment) and larger context (EU). For instance, increased employee awareness, actions, and responsibility regarding environmental sustainability are achieved through such education programs.

Organizations, both public and private, have major impacts on the natural environment, hence one way to ensure that this elicits positive outcomes is by utilizing these training programs.

Critical and comparative analysis

After examining, it becomes possible to further assess the soundness and accuracy of its arguments and findings. Many of the article's suggestions and arguments supporting their findings seem sound and are also present in similar studies/literature (Kola-Olusanya, 2013). For instance, the author(s) argue that given that organizations exert a larger impact on the natural environment, they are the right elements to focus on when wanting to revert the trends and impacts witnessed in the context of the natural environment. Furthermore, the most effective way of doing so is targeting the main resource of organizations, which is their employees. Doing so creates numerous avenues for sustainable development, one of which is that of employees further influencing other stakeholders, such as consumers, to also adopt sustainable development. Therefore, the central premise is that educating employees on sustainable development will lead them and extension, their respective organizations to operate sustainably, and this will positively contribute to the EU's objectives and initiatives regarding environmental sustainability.

Conclusion

Good quality education is observed in achieving a sustainable world. Adult environmental education helps learners in enhancing sustainable disposition, skills, and understanding to behave responsibly concerning the earth. Employee sustainability development education builds motivation and awareness to protect the present and future. The current study aims at proving that employee educational training and awareness programs on sustainable development help in achieving 2030 sustainable goals. Understanding sustainability helps in having awareness of the extent of environmental pollution and inequality from a global perspective. This awareness is vital in facilitating the approaches incorporated within the firm regarding the sustainable methods, which in this case would only be possible if the employees are able to have the interests of the company and the environment in mind, especially matters associated with the implementation process. With awareness, the aspect of employee resistance is also eliminated, leading to the effectiveness in the approaches included. These employees interact with the external stakeholders on a daily basis and hence, might also be an effective source of insight regarding the best ways to communicate sustainability to the external stakeholders, from the suppliers to the consumers. The research study focused on understanding how employees' education influences sustainable development. A high percentage of individuals are employees, which mean it is easy to enhance sustainable strategies through the organization, institutions, and the government. Therefore, employee education has a positive impact on sustainable development strategies.

For several decades, the negative impact humanity has been exerting on the natural environment has been rising, prompting global concerns around this issue. These outcomes have also been exacerbated by climate change and the numerous indicators of this event, such as melting glaciers, changing weather and climatic patterns, and the negative consequences that these bring to the social, political, and economic setting. As such, it is vital to identify effective strategies to reverse the negative outcomes that have taken place in the context of the natural environment, especially that which is caused by human action.

Modern society must establish long-term solutions to many of the prevailing challenges it faces, particularly in environmental sustainability. The selected article provides a unique approach that should be considered in the EU context and in the global environment. The author(s) advocate for organizations to initiate employee training programs concerning sustainable development, as this has the potential to positively contribute to the goals and initiatives set around this issue. This approach ensures that the modern workforce is environmentally conscious and because of this, can undertake numerous measures to ensure that their organizations operate sustainably. Additionally, a positive ripple effect can be achieved in which employees influence organizations, and the latter then influences larger society regarding sustainable development. As such, all crucial stakeholders concerning the issue of environmental sustainability should consider the proposed approach of utilizing employee training programs in this endeavor of helping the organization and in extension, society become more sustainable concerning their relationship with the natural environment.

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Green marketing and circular economy – two concepts intertwined in the era of industry 4.0

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Abstract

The goal of green marketing is to highlight a company's embracement of eco-friendly and sustainable practices in its products and business operations. Nowadays, in a world pressured by the always increasing production and globalization, this branch of marketing is gaining a considerable importance. It is closely related to the concept of circular economy and the way our societies produce and recycle. In this article, we discuss the relation between these concepts and their role in a world of industrialization and globalization. The main objective of the article is to show how circular economy and green marketing impact our society in a positive way. The main point is illustrated through the experience of a family-based coffee production start-up, which's activity is governed by these economy models. A qualitative methodology with SWOT analysis in the analysing process of the companies' activities is used.

Keywords: green marketing, circular economy, industrialization, globalization, production.

Jel Code: Q57, F20, M31.

Introduction

The creation and use of world-renowned good green marketing practices is a process that is directly related to the worldwide trend towards globalization, which is expanding the frontiers of international trade and allowing easy and rapid entry into ever-widening markets in the world. The starting points for the use of good marketing practices in a globalized world are related to the search for adequate marketing tools, through which there is a parallel increase in competition in countries and regions where a company enjoys consolidated market positions over the years. Thus, at a global and regional level, specific systems of market influences arise, which increase the importance of the marketing strategy of companies and lead it to become a leading tool to achieve the main objectives of any business but at the same time also comply with the global ecological requirements for a more sustainable development.

Theoretical framework

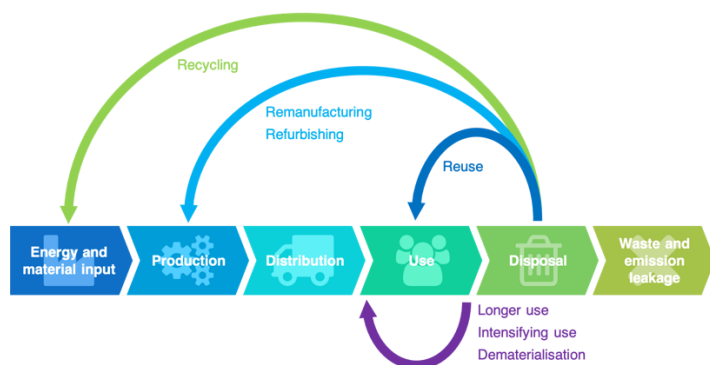
The green economy, and in particular the circular economy, seeks the balance between economic growth, social development and environmental health. In their application, the existing paradigms are put under doubt, and hence the challenge for systemic changes in management, value priorities and consumption patterns arise. The circular economy is an alternative to the traditional linear economy (produce, use, discard) whereby resources are kept in use as long as possible and maximum value is extracted from them during use. Then, at the end of each useful life, products and materials are restored and regenerated. The green economy, intertwined with the circular economy, takes a step towards commercialization thanks to green marketing that promotes the values of these two economies.

The current model of production and management of resources, goods and services that seeks to promote consumption in the short term is leading the planet to an unsustainable situation. The current economic system stands out diametrically from the life cycle of nature and collides with sustainable development, focused on the long term.

Taking the cyclical model of nature as an example, the circular economy is presented as a system for the use of resources where the reduction of elements prevails: minimizing production to the essential minimum, and when it is necessary to use the product, betting on reuse of the elements that, due to their properties, cannot return to the environment (Medina, 2016).

In other words, the circular economy advocates using as many biodegradable materials as possible in the manufacture of consumer goods -biological nutrients- so that they can return to nature without causing environmental damage at the end of their useful life. In cases where it is not possible to use eco-friendly materials -technical nutrients: electronic components, metal, batteries - the objective will be to facilitate a simple decoupling to give it a new life by reincorporating them into the production cycle and composing a new piece. When this is not possible, it will be recycled in an environmentally friendly way. By definition, the circular economy is restorative and regenerative, and aims to ensure that products, components and resources in general maintain their utility and value at all times. The circular economy is the intersection of environmental and economic aspects. The circular economy is generating employment. The waste management sector represents thousands of jobs. In a context of scarcity and fluctuating costs of raw materials, the circular economy contributes to the security of supply and the reindustrialization of the national territory.

The circular economy is very aware of production processes and proposes reusing, repairing or recycling, increasing sustainable manufacturing and consumption. In this way, in addition to reducing waste, energy is saved and it contributes to avoiding the irreversible damage caused in terms of climate and biodiversity, and air, soil and water pollution, due to the use of waste resources at a rate that exceeds the Earth's capacity to renew them (Fuentes, 2017).

Figure 1: The cycle of the circular economy

Source: Herrera (2016)

There are ten configuring features that define how the circular economy should work:

1. The waste becomes a resource: it is the main characteristic. All biodegradable material returns to nature and non-biodegradable material is reused.
2. The second use: reintroducing into the economic circuit those products that no longer correspond to the initial needs of consumers.
3. Reuse: reuse certain residues or certain parts of them, which can still work for the production of new products.
4. Repair: finding a second life for damaged products.
5. Recycling: use the materials found in the waste.
6. Recovery: energy use of waste that cannot be recycled.
7. Economy of functionality: the circular economy proposes to eliminate the sale of products in many cases to implement a system of rental of goods. When the product finishes its main function, it returns to the company, which will disassemble it to reuse its valid parts.
8. Energy from renewable sources: elimination of fossil fuels to produce the product, reuse and recycle.
9. The eco-conception: considers the environmental impacts throughout the life cycle of a product and integrates them from its conception.
10. Industrial and territorial ecology: establishment of a mode of industrial organization in the same territory characterized by an optimized management of stocks and flows of materials, energy and services.

The objective is to implement an economy based on the principle of "closing the life cycle" of products, producing goods and services while reducing the consumption and waste of raw materials, water and energy (Guzmán, 2017).

One of the problems facing the Circular Economy is that many products are difficult to recycle or disassemble. The designers of current products do not take waste management into account and for now, they do not have solid reasons to create, taking into account the end of life of their products. Therefore, the Circular Economy requires an integration of the product life cycle, which goes from the extraction of raw materials to disposal, reuse and/or recycling. This can be done individually (if companies own the entire life cycle of a product) or through intense inter-company collaboration.

Methodology

To carry out the study, different scientific methods are used on the basis of which the corresponding conclusions are drawn. The objective of the article is to show how green marketing and circular economy change the way of working and producing in different companies in order to make them eco-friendly and saving the nature and the recourses of the planet. The methodology used is of a qualitative nature and comparison is used to show some of the good practices used by now.

An instrument used in the methodology is the SWOT analysis which is a tool for investigating various business situations and decision making. It provides the necessary framework to review the organizational strategy and development direction of a company, but also a project, a business proposal for the future development of the company.

The first part of the analysis are the strengths. They are everything that can constitute a competitive advantage for the company in the area of research. Under the strengths of a company in the SWOT analysis, strong brands, patents, reputation among consumers, exclusive access to natural resources, favourable access to distribution channels can be considered.

The second component of the analysis are the weaknesses. They are the elements of a company that need to be improved, that are less developed than those of competing companies in the sector. A company's weaknesses can include a weak brand, lack of patent protection, poor reputation among the consumers, expensive resources, lack of access to quality natural resources, unfavourable access to distribution channels and more.

The third component of the SWOT analysis are the opportunities. When considering opportunities, it is helpful to analyse strengths and determine if they are a prerequisite for uncovering new opportunities. Alternatively, weaknesses can be analysed to see if new opportunities can be identified by eliminating them. Opportunities can arise through changes in technology, markets, government regulations, social change, the removal of trade barriers, and lifestyle changes.

The last component of the SWOT analysis are the threats. Threats can come from changing consumer preferences, the emergence of substitute products, new government regulations, trade barriers and more. The company must constantly monitor changes in its external environment to avoid or reduce the possible occurrence of threats to its activities (Stanford Institute, 2020).

Results and practical example

In this chapter the author is presenting different significative examples of green marketing but mostly of the use of circular economy in the era of industrialization 4.0.

Finland, the country that organized the first World Forum on Circular Economy in 2017, has already drawn up a roadmap towards those goals. This includes, among other measures, the redesign of public offices to make them ecological, the use of biogas as fuel for cars, and the use of heat from industrial processes.

According to the June 2016 Eurobarometer, Spain is the third country in the European Union with the highest number of companies (85%) that have practiced the circular economy, surpassed only by Malta (95%) and Ireland (89%). Among the companies that are committed to the circular economy in Spain, many examples can be found and in practically all sectors of the economy: Ecoalf or Lefrik (fashion and accessories); Basurama, (ecological waste); Zicla, (urban elements); ATP (enlightenment); Ecodecco (furniture); Anfevi (glass); Cetaquia and Life Reagritech (water); Ecotic or Tecnalía (technology).

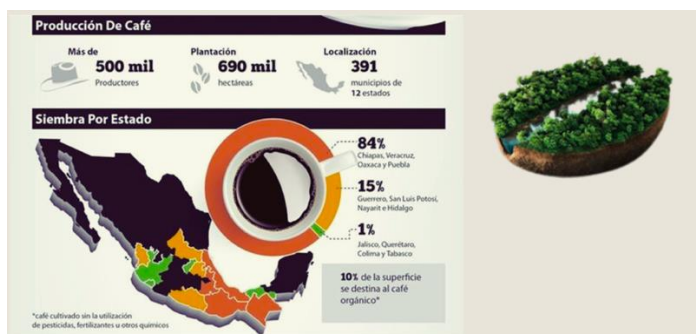
The first presented company, using both the circular economy and green marketing in its activities, is Pizpireto, a Mexican coffee company from the state of Veracruz. The Pizpireto company was created in 2020. The company has had a great development since then since it currently has important links with the producers of the coffee-growing region in the state of Veracruz. Its headquarters are in the city of Veracruz, but it has strong links with coffee growers in Alto Lucero, in the highlands of Veracruz state, from where it gets its coffee. Due to its size, it is still a micro-company, with a staff of less than 10 people since it was only a short time after its creation, but thanks to its innovative concepts it is developing very fast. Pizpireto's values can be found in its logo. It is a coffee leaf that demonstrates the continuous work and the implementation of actions of the green marketing, starting with the colour of the logo. Those actions are generated by work in the environment, which relates the company to the philosophy of fair and responsible trade.

Figure 2: Pizpireto's logo

Source: Pizpireto's social media (2022)

The upper part of the logo represents the mountains because height in terms of coffee is associated with quality. Pizpireto works the entire value chain of the product – from the moment the coffee is planted, through its harvest, processing, where the pulp of the coffee cherry is removed and dried to transform the harvested coffee into coffee ready for the subsequent stages. Ready-to-roast coffee is stored in bags. They are special and part of the green economy values, because they are reusable and made from special recycled materials. Optimizing storage using *grain pro bags*, allows that once the coffee is dry with the desired humidity, the bag is a barrier with the environment that preserves the humidity and the quality of the product.

The central part of the company logo represents a coffee bean, which is the core of Pizpireto's philosophy. Within the logo at the bottom, a hand is shown, synonymous to the commitment, support, recognition and collaboration with the first link in the value chain – the coffee farmer. Pizpireto participates in the entire coffee value chain. Its activities begin with the coffee farmer. He grows, is in charge of processing the coffee, then follows the roaster, he receives the green gold coffee and is in charge of roasting and delivering the roasted coffee to a barista who prepares it and delivers it to the final consumer. Pizpireto encompasses all these actions, it is more than a roaster, involved with the coffee grower and processing the coffee. In the standard value chain, there is an intermediary who buys the grain from the coffee grower, Pizpireto does not work with intermediaries and does the work together with the coffee grower, which is part of the *Fair-Trade* philosophy.

Figure 3: Pizpireto´s main data

Source: Pizpireto´s social media (2022)

The three pillars of the company are: care for the environment, social commitment and quality.

The competitive advantages of the company are:

Fresh product with small batches and according to demand

Quality based on training: to the company, to the coffee grower, with a better philosophy and professionalism

Flexibility – different roast and grind profiles

Environmental impact – open and committed to offering good practices for the environment

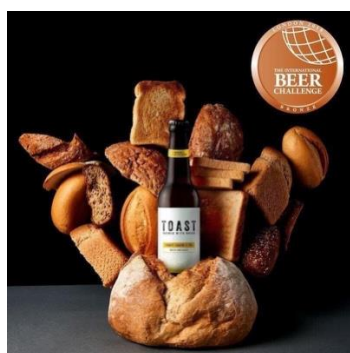
Collaboration - teamwork, not only in the sale of coffee; Pizpireto is a roasting house, it is willing to collaborate with projects and teamwork with other companies.

It was decided to create the company with the concept of fair and responsible trade and circular economy to help the environment and coffee growers, so that the company responds to its own philosophy and values. The reasons for implementing it were to create a responsible company with the environment and the producers, to see the personal values of the creators reflected in the company. The concept is reflected from the beginning in all activities.

Pizpireto's goal as a company is to develop an eco-social project. The general objectives are to offer excellent quality coffee, improve the quality of life of coffee-growing families, actively collaborate in caring for the environment and the responsible use of resources, but also create a legacy. In the short, medium and long term, a reforestation of the farms is planned, using organic fertilizers, implementing a water recycling system, optimizing the drying system with solar energy, continuous training, optimization and selection of grains with a new system, improving payment to the farmer.

The next company is from Great Britain and its name is Toast Ale. Food waste is a global problem, and one of the most frequently thrown away products is bread: it is cheap and has a very short shelf life. In the UK, for example, 44% of all bread produced in the country is thrown away. Toast Ale is a start-up that tackles this problem in a very original way: it produces beer. The company is dedicated to collecting leftover bread from bakeries and sandwich shops and incorporating it into the craft beer brewing process with malted barley, hops, yeast and water. It doesn't use special technology, but manages to replace almost a third of the malted barley it needs to make beer, so production costs are significantly reduced. The beer produced in this way helps to prevent the waste of 1 million slices of bread. 1,023,373 cases of beer are produced: 833,637 in the UK, 131,501 in the US and 58,235 with global partners. By using less barley and preventing bread from being thrown away, emissions of 32.1 t CO₂ are avoided. The company is donating £22,082.62 to Feedback, a major charity partner. The vision of both companies is a world where nutritious and delicious food is available to all and human activities complement, not degrade, the environment. The company's craft beer recipe has been shared 44,655 times, it has direct collaborations with 20 breweries and 23 more in negotiations. The company's motto is: "Raise a toast, save the world."

Figure 4: Producing beer from bread



Source: Toast Ale website (2022)

Another example can be found if we look at the big companies that incorporate the circular economy into materials for the production of products, in this case Nike, who use recycled materials to make their shoes. 71% of all Nike shoes and apparel include recycled materials. In addition, Nike uses 29 high-quality materials produced from factory scrap - reusing what would otherwise be a loss of value. By the end of the 2022 financial year, the company aims to send no waste from shoe production to landfill, and excess materials in production will fuel a future circular economy model. One of the keys to success will be the development of a new, original palette of low-impact, renewable materials.

The company's priority is creating zero waste. Its vision is for a future based on the circular economy, where the concept of waste does not even exist. Eliminating waste wherever possible, starting with designing products based on waste and optimizing production processes are some of the company's goals. The company knows that these activities are key changes in design and manufacturing processes and are critical to achieving the aim of halving its harmful environmental impact. The best way to reduce waste is by designing products from the ground

up. At Nike, a set of tools have been created to help create products with better solutions to eliminate waste. The Materials Sustainability Index (MSI) accounts for and rates the energy, water and chemicals used to produce materials, as well as the waste generated in the process. The output of these materials is the basis for product results in the Footwear Sustainability Index (FSI) and the Apparel Sustainability Index (ASI). Both indices assess waste generated in manufacturing based on product design. Together, these results provide an environmental profile that Nike's product development teams can use throughout the design and development process.

Google is the fourth example presented by the author like a company which has adopted the circular economy.

Circular economy initiatives are also being taken across Google's operations, from the way the company manages the hardware in its data centres, the materials used in its buildings, to the way the company's kitchen's function. For example, over the past five years, the company has improved data centre operations and hardware to extract 3.5 times more computing power from the same amount of electricity. Since 2007, Google has rerouted aging servers to avoid purchasing over 300,000 new replacement machines. In addition to its large-scale composting program, Google uses a software system in its kitchens to track food waste to consumers. Google's partnership with the Ellen MacArthur Foundation will help improve to its waste reduction and sustainability programs. Google believes that business plays a key role as it is part of the solution to move from a global economy based on "take-use-dispose" to one based on recycling waste. Google's goal is to incorporate circular economy principles into the fabric of its infrastructure, operations and culture.

Finally, a SWOT analysis was done in order to compare the actual development and search the opportunities and challenges for those projects:

Figure 5: SWOT Analysis

Strengths

Very good quality of products
Affordable prices
Use of *Fair-Trade and green* practices
Greater control of the value and supply chain

Opportunities

Creation of a better-quality product
Preserving the environment by recycling

Weaknesses

High costs of production
Difficult to achieve due to the recent implementation of the practices
Not very commonly used

Threats

The competition
Substitute products
Low visibility in the market

Receiving better results due to the saving of materials Products with lower prices

Source: Elaborated by the author (2022)

Conclusions

The current world energy situation is the result of a combination of many political, economic, social, environmental events and numerous crises in the last decades. Since the beginning of the 21st century, there have been pronounced problems in the current energy model, which is based primarily on fossil minerals: oil, coal, and natural gas. The limits of this model are increasingly evident, given the high prices of fuels, but also the social and environmental consequences. Many countries are looking for alternatives that do not run out over time and, above all, that do not contribute to climate change. The green politics, economy and even marketing combined with the ideas of the circular economy are part of the solution. These measures give a new impetus to energy security in the world for a greater use of green energy. The widespread use of renewable sources and the introduction of energy efficiency measures such as the circular economy and green marketing are among the priorities of companies today and correspond to the objectives of reducing greenhouse gas emissions. Increased use of energy from renewable sources could also reduce the world's dependence on fossil fuels, contributing to a better energy future for the entire planet.

In conclusion, it could be said that world development and dynamic globalization occur in a world in which, based on multinational companies and new technologies, information, practices and activities are interconnected and in constant exchange. The challenges that a company faces in a dynamic and globalized world are great and are related to its ability to change and adapt quickly and successfully to new situations. Only such innovative companies will be able to survive and develop a successful and profitable business today and, in the future, ensuring a better future for the entire planet.

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Circular Economy transition in the fashion industry: The Case of Lindex.Xheni RUSI¹,¹ University of Tiranaxheni.rusi@unitir.edu.al**Abstract**

The fashion industry is the world's second largest consumption industry and at the same time, it is one of the most polluting industries worldwide. The fashion industry has traditionally operated through linear economics utilizing a take-make-waste supply chain. The emergence of the circular economy has encouraged this industry to embrace the attributes and value that comes with its use. Using an abductive approach, a case study was conducted on a fashion company that is moving through its strategies towards the circular economy. The findings of the study show the difficulties of the transition of this company towards the circular economy, which go hand in hand with the findings of the literature of this industry. In this study, it is identified that the suppliers are the main drivers towards closing the loop, but not only, also the employees and the customers are very important actors in this process. One of the main barriers this company faces is related to the transparency throughout the supply chain. The strategies and practices followed by the company to mitigate barriers and be more circular are different, emphasizing the strategy 'Respect the Planet' and 'Product design'. The company's strategic plans are to achieve the objectives set by the EU for sustainability by 2025. The company used in this study is Lindex, with headquartered in Sweden and a franchise in the Albanian market. Although Albania is a non-producing country, it is a consuming country that must support the principles of circular economy and circular companies.

Keywords: Circular economy, Fashion industry, Sustainability, Transition, Fashion value chain

Jel Code: O44, Q01, Q56

Introduction

Although we are in a continuous transformation process, our industrial economy still seems to be based on the principles of a linear model: by using resources follow: 'take-make waste'. In their activity, companies use different resources to produce products and at the end of the process, the product is discarded when it does not serve its purpose. Following the linear model,

businesses are increasingly faced with resource constraints and high prices throughout their supply chain. Business leaders are in search of a ‘better hedge’ and an industrial model that decouples revenues from material input: the ‘circular economy’ [1]. The circular economy is playing an important role in mitigating the limitations associated with the linear economy, gaining special importance especially in the fashion industry. Global textiles production almost doubled between 2000 and 2015, and the consumption of clothing and footwear is expected to increase by 63% by 2030 [2].

Clothes are an essential part of our daily lives and choosing what we wear has always been an important cultural marker of who we are. Manufacturing companies in the fashion industry seem to have increased their assortments by producing new collections in a shorter time. Consumers can choose from a wide variety of new collections with favorable prices that allow them to expand and refresh their wardrobe. This has resulted in the increased annual production of a large number of garments [3].

The sector's rapid growth has been enabled by the advent of fast fashion, globalized supply chains and a massive increase in the consumption of garments. In the EU, the consumption of textiles, most of which are imported, now accounts on average for the fourth highest negative impact on the environment and on climate change and third highest for water and land use from a global life cycle perspective [4]. Regarding to these perturbing facts, the sector will need to integrate circularity principles in its business models and minimize its environmental footprint. Applying a Circular Economy (CE) model and closing material loops implies changes that affect business models, logistics, secured offers, services and manufacturing processes. Companies are currently struggling with applying CE since there is no general view today of how firms should include sustainability into their business models due to a lack of knowledge within the field [5].

To make the required activities in CE economically feasible, new business models are in need, one type of business model is the Circular Business Model. Linear business models are the current standard in most manufacturing industries. If we compare the two business models, the CBM model, which is based on reproduction and reuse, has advantages in terms of cost and environment [6]. The fashion industry can rework on their production processes, emphasize using ethical materials, fair trade practices, collaborations, value networks and reducing waste, thereby creating an eco-friendly label [7]. A circular economy approach revolves around a planned reduction of energy and resource use to bring economic activity back into alignment with environmental health and human wellbeing. A shift towards circular fashion will also bring new benefits to the industry such as reducing material costs, accessing new markets, improving customer relationships, and reducing the risks of resource depletion [8].

The framework and the purpose of this study is to inform the fashion industry on the possibilities of accepting and implementing sustainable business models, adapting and implementing the principles of the circular economy in the traditional supply chains. Objectives of the study are addressed by posing the following research questions (RQs):

RQ1. How was the transition in the fashion industry from the Linear Economy to the Circular Economy?

RQ2. What are the main drivers and actors operating in the closed-loop fashion value chain?

RQ3. What were the challenges encountered during the implementation of the circular economy?

RQ4. What strategies can be considered as preparatory toward CE in the fashion industry?

The article is structured as follows: the first section serves as an introduction to the research issues. The second section will provide a literature review related to the research questions of this study. The third section is a description of the methodology and other data used for this study. The section below provides information on the selected company "Lindex", analyzing all the research questions. The last section is the conclusion, limitations and further analysis of the research.

Literature Review

2.1 Fashion and circular economy

There is a large number of definitions of the circular economy from different researchers. Referring to the European Commission, CE is explained as an economy “where the value of products, materials and resources is stored in economy for as long as possible, and the generation of waste is minimized [9]. The concept of circular economy gained an increasing attention in recent years as a way of overcoming sustainability issues embedded in the linear system, such as material scarcity, climate change, depletion of natural resources and waste generation [10]. European Commission published a new circular economy action plan in 2020, aiming at a more cleaner and competitive Europe, and textile (clothing and fabrics) has been identified as a priority product based on its environmental impact and circularity potential. [11]. There is a strong push within the fashion industry to make every phase of the production more sustainable, with a view to transition to a circular fashion model.

2.2 Transitions toward circular economy

CE provides a framework that could radically improve the present Business Models towards a regenerative industrial development [12]. The purpose of implementing circular economy in fashion is to develop a more sustainable and closed-loop system where the life cycle of garments is extended, and the value of the products and materials is maintained as long as possible [13]. In fact, increasing the lifespan of clothing is one of the most effective actions to reduce carbon, water and waste footprints – as well as providing valuable savings in resource costs (Table 1) [14].

Table 1. Potential footprint reductions and resource cost savings from using clothes for longer

Scenario	Carbon Saving	Water saving	Waste Saving
10% longer lifetime (i.e. 3 months longer)	8% (3 MtCO ₂ e)	10% (600 million m ³)	9% (150,000 tonnes)
33% longer lifetime (i.e., 9 months longer)	27% (10 MtCO ₂ e)	33% (2,000 million m ³)	22% (400,000 tonnes)

Resource: WRAP 2012

Circular thinking uses fewer resources, if we increase the lifetime of the product with 10%, we will preserve the water and environment reducing the waste by 9%, ending up in low-carbon use by reducing it by 8% , less use of energy and fewer virgin materials. [14].

Moving towards a circular economy means taking a system perspective on fashion, where all actors are included: designers, producers, manufacturers, suppliers, business and consumers. A transformation model towards a circular economy for the fashion industry is the RSA four-level model [15]. (Figure 1)

Figure 1: The Four Models of DCE, Design in a Circular Economy



Source: RSA 2016

The first level of this model focuses on Designing for Longevity: is about designing products that last, are well crafted and well made so that people don't want or need to throw them away. The second level include, designing for leasing/service: Service design is a growing area and is a key component to effective circular economy. It allows for higher specifications of design

and materials that increase life and durability. The third level include, designing for re-use in manufacture: emphasizes the feature of the lifetime of product use through reproduction. The fourth level focuses on Designing for material recovery: the reuse of waste to produce new fibers and threads. To become circular, the fashion industry must reinvent itself in how to design, what materials to use, how to dye, cut and sew, ship, sell, own, use and dispose of fashion. Better design and reuse can reduce the cost of raw materials and landfill cost and can create new business models and useful products. [16].

2.3 Collaboration with partners

The cooperation with partners in supply chain, is a key factor for fashion companies in their circular direction. They must have a common objective in their cooperation related to sustainability and focusing on the principles of the circular economy. Effective cross-chain and cross-sector collaboration are imperative for the large-scale establishment of a circular system [1].

For fashion companies, especially for local ones, it is very difficult to cover all the processes without the help of other suppliers in securing the raw material, developing the product design and production, distributing the product to the final consumer. From the perspective of a firm, there are a number of drivers that could motivate and reward the implementation of practices associated to circularity. The focus of the companies will remain on those drivers who are part of CE, as they become drivers of their transition [17]. Drivers are defined as reasons that might incentivize firms to proactively pursue a transition towards a CE paradigm in the way they do business [18].

According to Mattos et al., 2018 [19] drivers can be internal or external, consider as internal factors the organizational culture, the team's commitment to sustainability issues, the support of the stakeholders who share the same values, with the company's participation in a group that is implementing CE, such as sector, industry, or companies of the same geographical location. As external drivers: government support, legislation and geographical proximity. Researchers [20] have emphasized collaboration with suppliers and consumers to improve the sustainability of the entire supply network.

2.4 Challenges and Barriers

Applying circular economy principles to the fashion industry has many challenges and barriers that need to be mitigated. Barriers can be of different types, mentioning: high initial costs, changes in technology and changes in the way of driving. The barriers found in the literature review by Liu & Bai, 2013 [21], are directly related to the implementation of CE and divided as structural (employment and staff term limits), cultural (planning and production silos) and contextual (to circular economy).

Another categorization by Ritzén & Sandström, 2017 [22] empathies barriers as: technological (product design), financial barriers (lack of business cases illustrating possible revenues) as well as operational barriers (supply chain and infrastructure), attitudinal (perception and risk). Literature for barriers is inclusive. Other huge barriers found in literature is related to one of major actor in ecosystem. Lack of consumer interest and awareness has been highlighted as

one of the core barriers that slow down the transition towards circular economy. Hazen et al. (2017) point out that one challenge of CE is that consumers tend to have a poor opinion of remanufactured or reused products and are therefore unlikely to adopt them [23].

Circular Fashion Strategies

The circular economy is clearly beneficial to sustainability efforts, but it also offers economic benefits to organizations. Organizations, therefore, must rethink their business models from a circularity perspective. A circular business model is built on the rationale of how an organization creates, delivers, and captures value with and within closed material loops [24]. The transition to a circular model can be done in several ways. The more radical the technical or product innovation, the more challenging and the greater the likelihood that changes are required to the traditional business model [25]. Researchers describe different strategies that facilitate their circular approach. Circular strategies feature as part of a circular configuration: as part of a product system where two or more circular strategies are combined and implemented alongside each other [26]. Table 3 presents some of the strategies identified by the literature review.

Table 3. Strategies moving towards CE.

Strategies	Authors
Long Life strategy	[18], [27], [28]
Recycling strategy	[18], [29], [30], [31]
Traceability & information processing strategy	[32], [33], [34]
Design of products and services	[35], [1], [36]

Methodology

This study implements a qualitative exploratory research design. This study is performed in two stages. In Stage 1, a thorough literature review is done on a subject. In Stage 2, data are procured from the case company through semi-structured online interviews with company representative in Sweden. The primary data generated from the semi-structured online interviews provide a broader picture of the problem and complement the secondary data with specific information about the company taken as a case study, identifying the challenges of the transition to CE. Case studies are always used to gain a better understanding of usual and changing business practices in their social contexts [37]. In the semi-structural interview, the following issues were discussed:

- How was the transition from the Linear Economy to the Circular Economy?
- Who are the key drivers and actors operating in the closed fashion value chain?

- What were the challenges you encountered during the implementation of the circular economy?
- What strategies can be considered preparatory towards CE in the fashion industry?

Analyzing CASE STUDY

4.1. Lindex (case company)

The paper presents an in-depth case study on the company Lindex, which operates in the fashion industry. Lindex is one of the leading fashion companies in Europe, where for several years it has been expanding its activity in the Albanian market. With approximately 450 stores in 18 markets and worldwide online sales through third-party partnerships. Lindex offers inspiring and affordable fashion and the assortment includes several different concepts within womenswear, childrenswear, underwear and cosmetics. Lindex's highest purpose is to inspire and empower women everywhere, and Lindex's sustainability promise is to make a difference for future generations by empowering women, respecting the planet and ensuring human rights.

4.2. Lindex's value creation through circular economy practices

Lindex have a responsibility to contribute to the UN Sustainable Development Goals, for the customers, for society and the business today and tomorrow. They are growing collaborations to build foundations for critical issues such as workshops health and safety, and living wages. This means that Lindex is exploring how Innovative technology can help reduce the climate impact and support people.

With a growing population and unsustainable consumption models, Lindex use up more natural resources than the planet can handle. The fashion industry depends on and consumes a lot of natural resources. To meet these challenges, resources need to be used in the best way and a circular approach to fashion is the only way to go.

4.3. Lindex circular transformation

Lindex is at a turning point for the entire society and business as usual is now a major business risk. To enable the transformation Lindex work with several aspects of circularity – circular products, a circular supply chain and circular customer journeys.

4.3.1. Circular products

Creating products that are designed for a long lifetime, made from recycled and regenerative materials and that can be reused, remade and recycled back into the system several times. Lindex has spent the past five years working with industry experts, developing internal tools, and building knowledge among product teams based on the expertise of the Ellen MacArthur Foundation and the EU Waste Hierarchy. In 2021 the company summarized all the findings into ten design principles—each aligned with the broader categories of ‘design for longevity’ or ‘design for circularity’. Examples of Circular products: Circular denim, Closely brand, the garments are made to fit and flatter a range of body types, while adhering to strict sustainability criteria during manufacturing in a transparent supply chain.

4.3.2. Circular supply chain

Build a supply chain that keeps products and materials in circulation and uses resource efficient production processes powered by renewable energy. Making sure that all operations are free of hazardous chemicals to ensure safe products and enable reuse and recycling the products. Lindex's supply chain will keep products and materials in circulation.

4.3.3. Circular customer journeys

Increasing the use and prolonging the lifetime of the products by making it easier for the customer to care for, repair, reuse and recycle the products. Lindex will increase the use, active wear, and lifetime of every product with extended offerings such as care, repair and second-hand.

4.4. DRIVERS TOWARD CE

4.4.1 Collaboration with partners

When it comes to choosing suppliers, Lindex is very selective. They want to work with supply chain partners who share their vision for a transparent and sustainable fashion industry. All selected business partners must sign and adhere to the sustainability of the company engagement and code of conduct, which describe expectations for suppliers and business partners. This includes compliance with the minimum international requirements and standards, and aspirations to move beyond compliance and focusing on continuous improvement.

The Lindex Management System establishes a structure to find the right partners and ensure that the company is aligned in efforts towards a more sustainable way of working. The main tools are:

- The human rights policy,
- The code of conduct,
- The sustainability commitment, and
- The Lindex business scorecard.

The first step, before any work with a potential supplier can take place, is an on-site pre-assessment. This pre-assessment can be conducted by Lindex internal team, or by one of the third-party auditors; it serves as a preliminary evaluation of potential suppliers and factories based on business factors alongside social and environmental criteria. All requirements must be passed to become a supplier for Lindex. Once a new supplier is approved to become part of the supply chain, the company begin auditing on a regular basis. This includes both announced and unannounced audits, and these might be performed by the company or by the auditing partners.

Lindex work with partners who take responsibility for their own social and environmental sustainability. With partners who share Lindex working style, which is built on open and collaborative relationships. Lindex keep this group of key supply chain partners small to build

close working relationships; there are 30 key suppliers who manufacture 80 per cent of the order quantity. Working in close and long-term collaborations with the suppliers enables Lindex to commit to one another, and think longer-term, to implement new processes, or invest together in improvement projects. This help to better understand each supplier's challenges, as well as support and then reward their improvements.

Much of the cooperation between Lindex and suppliers goes through the company regional production offices, which is established in Lindex major sourcing and production regions: China, Hong Kong, Bangladesh, India, Myanmar, and Turkey. The local presence in these markets enables to cooperate closely, and to have a Lindex presence on-site as needed. Additionally, many of these suppliers have implemented good practices already: Some are certified according to the Global Organic Textile Standard (GOTS), others use bluesign-approved chemicals.

Lindex Challenges and Barriers towards CE

Acknowledging the challenges in relation to human rights, protecting the environment and being transparent about them is the basis for addressing these challenges and making improvements. Many of these are structural issues, but Lindex continues to address these challenges by collaborating with their suppliers and industry stakeholders, and being open to the company's obstacles and expectations. Some of the challenges directly related to CE implementation are presented in tabular form:

Challenges & Barriers	Lindex Approach for change
<p>Transparency Opaque supply chains are at a greater risk for forced and/or child labor. However, mapping further down the supply chain is more challenging, and the company leverage to demand improvements decreases.</p> <p>Another current challenge relates to refugees working in the supply chain, who may be taken advantage of if they do not possess the proper work documentation.</p>	<p>Lindex aim to build strong relationships, based on trust, with a consolidated group of suppliers. The company maintain a presence in the factories through their local production offices.</p> <p>Lindex work with self-assessments with the most important partners in order to build internal capacity and ownership with them.</p>
<p>Social dialogue Without social dialogue, there cannot be proper management or feedback systems, and workers' voices may not be heard. Social dialogue is a pre-condition for workers to exercise their</p>	<p>Through "WE Women" by Lindex, it educate the supplier's factory management on gender equality and how to integrate it into management systems.</p>

right to Freedom of Association and collective bargaining.

Culturally, worker voice may not be valued and language barriers may lead to marginalization. The question of gender equity and equality is a growing concern in the industry where management positions tend to be held by men.

Freedom of Association, overtime and documented management systems are systemic issues which must be tackled with collective action. Lindex suppliers, however, must show progress in these areas within a reasonable timeframe.

Living wage

It is a human right to have a wage that can provide a decent living. Wages are set by national or local laws; therefore an issue which must be solved by collaboration between governments, unions, employees and employers, where social dialogue is the foundation.

Lindex have developed a 2025 Living Wage Roadmap. The goal is: Lindex suppliers who stand for 80% of the production work actively with a living wage programme by 2025.

Lindex Strategies

As more companies like Lindex publicly take a stand on issues such as climate change, pollution, and biodiversity, the companies are stronger when they stand together. The leverage the companies can create in cooperation with one another goes far beyond what any of us could do individually. The company works extensively with industry peers and other stakeholders to drive structural and legislative change. This approach has a tangible impact as the European Green Deal continues. In the framework of the European Green Deal, Lindex is also contributing to the dialogue that is shaping the EU Textile Strategy. The clothing industry is moving towards new circular business models, a clear adaptation over the old linear model. Lindex also stressed the importance of supporting workers in developing countries, while protecting their human rights and continuing to push toward the achievement of the Sustainable Development Goals, and the ultimate goal of eradicating poverty. Lindex promise to make a difference for future generations in three divided areas:

Respect the planet strategy

Having a circular business approach by prolonging the lifetime of Lindex products and using the resources in a smartest way possible in all the operations.

Being a water responsibly company in the whole value chain, reduce the risk of water scarcity in areas connected to company operations and together with business partners provide access to water and sanitation in factories and nearby communities.

Design Strategy where the entire assortment will be designed for longevity and/or circularity. Design choices impact materials, production processes, product lifetime, use patterns and end-of-life opportunities. The focus is on creating products that are made from recycled or regenerative materials, designed for longevity where they can have a long lifetime in a

customer's wardrobe before being resold and then ultimately being recycled back into the system.

Empower women strategy

Taking the lead in creating fair and equal workplaces for women

Supporting a stable lifestyle and make sure women across Lindex value chain fulfill their potential

Ensure Human Rights

Advocating respect for human rights, making sure the whole value chain is progressing within living wage, that its workplaces are safe and healthy, free from harassment and discrimination

Lindex with its strategies and promises supports the UN Sustainable Development Goals to which the business can make a significant contribution.

Conclusion, Limitations and further analysis of the research

The fashion industry is the world's second largest consumption industry and at the same time, it is one of the most polluting industries worldwide. The fashion industry has traditionally operated through linear economics utilizing a take-make-waste supply chain. The emergence of the circular economy has encouraged this industry to embrace the attributes and value that comes with its use.

The transition towards the circular economy for all industries has been difficult, highlighting the existence of high initial costs, the lack of information on long-term benefits, new business models and changes in operating strategies. Applying circular economy principles to the fashion industry has many challenges and barriers like technological, structural, product design, reclassification of materials, recycle and reuse materials. To facilitate challenges and to mitigate barriers companies need drivers toward CE. For fashion companies, it is very difficult to cover all the processes without the help of other suppliers in securing the raw material, developing the product design and production, distributing the product. In Lindex case study, we identified suppliers as the main driver in the transition to CE, and this results align with (Simpson, 2005), as well as customers and staff (Liu & Bai 2013). Although Lindex has taken that important step towards CE, it continues to face challenges in achieving its objective to become a completely circular company. Some of the main challenges include Transparency, Social Dialogue and Living Wage, for which the company has drawn up long-term plans translated into action strategies. Lindex continuing to push toward the achievement of the Sustainable Development Goals, implementing the strategy of the protection of the planet where it is mainly focused on product design, water responsibly company and using the resource in a smartest way. This study will help fashion companies to understand how they can collaborate with various stakeholders to develop sustainable businesses. The case company used in the study may inspire other companies to transform their traditional business model to a closed-loop circular model, using the right drivers and strategies.

This qualitative study has a limited data set, and this constitutes the main limitation of the research. Further studies are needed to make more generalizable statements about the fashion industry. In the future, more case studies can be analyzed to gain a deep understanding of the transition from LE to CE in the fashion industry for the closed value chain. Further, studies can be conducted to compare development strategies in the fashion industry in facilitating circular practices.

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Integrating Circular Economy into Gender-Responsive Policies

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Abstract

Albania has achieved a good progress in implementing Gender-Responsive approach into National Strategies and Plans and advancing the commitment even in the Medium-Term Budgeting Program (MTBP). The purpose of this paper is to examine an important trend in Government Strategies and Plans: integration of Circular Economy (CE) into gender equality objectives. Methodology is based on a content analysis of strategic documents as “European Gender Action Plan III 2021-2025 (EU GAP III)” and “Gender Equality National Strategy, 2021-2030 (GENS)”, and it will be linked to the CE aspects integrated in these documents. Moreover, the analysis shows the alignment of objectives related to circular economy with the Sustainable Development Goals (SDGs) required to be achieved. Based on study results, nowadays the challenge for a "good budgeting" is to address in this important process the gender equality and environment issues that a country is facing.

Keywords: Circular Economy, Green Budgeting, Gender Responsive Budgeting, Sustainable Development Goals, *Gender Equality National Strategy 2021-2030*

Jel Code: Q56, Q58, D63, H61, J16

1. Introduction

The latest strategic trend shows that governments of many countries highlight the need for gender equality and women’s empowerment in national level and have been committed to implement “Gender-Responsive Budgets” and adjusting spending in ways to ensure gender equality through this process.

The integration of the gender perspective in the existing framework of the MTBP started in 2012 with the approval by the Council of Ministers of the Republic of Albania of Decision no. 465 (VKM), dated 18.7.2012 "On gender integration in the Medium-Term Budget Program". However, the most important step for the institutionalization of gender budgeting remains the inclusion in 2006 of gender equality in the "Organic Budget Law" as one of the essential principles of budget planning at the central and local level.

Gender equality is necessary for the circular economy to create a sustainable and comprehensive development [10]. The European Commission adopted a Circular Economy Package to stimulate the transition of businesses and consumers towards a circular economy, where resources are used in a more sustainable manner [16]. Building a green economy helps to achieve multiple Sustainable Development Goals. CE it is not considered just a good economic model designed to benefit businesses but even a development strategy to benefit society by creation of new green jobs, leading to economic growth and protection of the environment [8].

After reviewing the relevant literature and government's gender-related documents, the main questions of the article are:

Why is gender perspective important for the Circular Economy?

What do gender equality-related documents tell us about CE? We examine if there are policies that promote the increasing participation of women in circular and green economy activities?

To what extent is the Medium-Term Budget Program used to support achievement of the SDGs, respectively related to Gender Equality and Environment?

2. Literature Review

2.1 Definitions

“Gender-responsive policies”, are policies that intentionally employ gender considerations to affect the design, implementation and their results for the purpose to reflect girls’ and women’s realities and needs. In relation to this concept is explained that “gender-responsiveness”, means focusing in considerations related women, respectively their unique needs, perspectives and experiences, developmental differences between women and men, girls and boys and ultimately empowering girls and women [9].

“Gender-responsive budgeting” (GRB) helps identifying and reflecting needed interventions to address gender gaps in sector and local government policies, plans and budgets. It contributes to the advancement of gender equality and the fulfillment of women's rights. GB begins with analysis of the gender differentiated impact of revenue-raising policies and the allocation of public resources and progresses to integrate gender into budget-planning [9]. It has been concluded by field researchers that a fairer distribution of available resources would enable the achievement of equality and sustainable growth and in case of inaction the cost is simply too high [1]. It should not be considered just an element to achieve equality, but an essential financial tool to bring institutional structural change.

For the integration of the gender perspective in the budget policies in Albania, the term "gender budgeting" was initially used in MTBP 2013-2015 and 2016-2018. Meanwhile, since the preparation and publication of the Gender Budgeting Manual 2019, the term "gender responsive budgeting" is used, being considered as a comprehensive definition that gives importance not only to gender sensitivity but also to the timely and effective responsiveness of all institutions regarding sensitive gender issues [2]

“Circular Economy” is a concept strongly related to the green economy and can be defined as a resource-efficient economy where nothing is wasted. It supports the transformation of the industry and infrastructure to more sustainable consumption and production patterns [14].

Through the preparation of official documents at the national level, more importance has been given to the integration of the gender perspective and specifically the achievement of Goal 5 (SDGs) through the national strategies and plans with the implementation of NSGE 2021-2030. Another key result over this journey was to place women even at the heart of budgeting process through the integration of gender equality concept in Medium-Term Budgeting Program 2013-2015, starting in the first phase with the incorporation of the principles of gender equality in 9 budgeting programs and achieving an increasing number of programs during the last years with the inclusion in the recent MTBP 2022-2024 of 47 budgeting programs [3].

2.2 Gender Responsive Approach included in Circular Economy

“women can be the engines and souls of the circular economy [20]”

The framework of the 2030 Agenda, suggest that gender equality as a specific goal can contribute for the achievement of inclusive and sustainable development. Previous studies show a low participation of women in science, technology, engineering, and mathematics (STEM) activities and also in key sectors in the transition to circularity, as the power and utilities sector. To address these gender inequalities within the circular economy it is necessary an increasing of women’s participation in this field. In turn, gender mainstreaming into the entire circular economy (CE) will ensure an equitable and sustainable development. In this context, circular economy model may be used as an effective tool to achieve greater equality [10]. Women can drive the circular economy as they have already proven that are equipped with the ethical norms necessities to maintain the balance between profit and social responsibility [11]

2.3 Circular Economy relation with National Strategy for Gender Equality 2021-2030

Improving the legal framework and constantly aligning it with international instruments is a must. The measures and actions foreseen in the "NSGE 2021 - 2030" are also related to the measures and actions foreseen in the Gender Equality Strategy 2020-2025 of the European Union, further specified in the Action Plan for Gender Equality (GAP III) 2021-2025. "NSGE 2021 -2030" contains objectives and measures related to the thematic areas of EU GAP III such as: "Promotion of economic and social rights and empowerment of girls and women", as well as "Addressing the challenges and exploiting the opportunities of provided by the transition to the green economy, digital transformation, climate change and the environment" [4].

Taking into consideration that the circular economy supports gender equality, the recent NSGE has embodied it in its policies. In the main strategic goals of this strategy, new areas that have been unaddressed or very little addressed in relation to gender equality (environment and climate change, digitization, green economy, etc.) have taken place. Specifically:

National Strategy for Gender Equality

2021-2030

POLICY I

Strategic Goal I - Fulfillment of economic and social rights of women, young women, girls, and men, young men and boys in the society and the empowerment of women, young women, and girls in all their diversity, aiming at an **improvement and sustainability of environmental (green) economy** and their **equal participation in the digitalization process**.

Under **Specific Objective I.2**. "Increased access of women, young women, and girls in all their diversity to financial services and products and productive resources", it has been projected:

Expected outcome:

ii. Improved practices enabling the economic empowerment of women, young women, and girls in all their diversity by **creating fiscal facilities and economic support** with grants, aimed at **orienting them towards environmental (green) economy and digitalization**.

Measures:

I.2.2. **Stimulation and support** for the entrepreneurship of women, young women, and girls in all their diversity (from rural areas, ethnic minorities, persons with disabilities, LGBTI+, the elderly, single mothers, survivors of violence/trafficking, etc.) including for **innovative ideas on environmental economy and digitalization**

A significant improvement in the NSGE 2021-2030 compared to the Strategic Goal I included in the NSGE 2016-2020 "Economic empowerment of women and men", is the new connection established with the Circular Economy. This strategic goal has been further expanded, aiming not only at the socio-economic empowerment of women, young women and girls in all their diversity by reducing their barriers in relation to the labor market, but also aiming to enable their advancement towards the environmental economy of digitization.

From the evaluation carried out on the implementation of this strategy and its action plan, it results that NSGE 2016-2020 Strategic Goal 1: Economic empowerment of women and men, has been realized to the extent of 74.7%. The assessment showed that there is an increase in the participation of women and girls in the labor market and an improvement in the gender gap in wages according to official data (10.1%). In relation to CE issues, it turns out that there is an increase in the involvement of girls and young women in the fields of study related to science and innovation, but this increase does not seem to be constant and sustainable for each academic year. The same when talking about the employment of women in agriculture and extractive industries, etc., where the percentage of their employment falls from 2016 to 2019.

2.4 Circular Economy relation to SDGs through the interaction with NSGE.

In this subsection we explain the interaction of circular economy with gender-responsive objectives of NSGE 2021-2030 for the achievement of Sustainable Development Goals and where gender equality and environment issues are included as specific goals and as multidimension SDGs. NSGE 2021-2030 is closely related to the Sustainable Development Goals. Specifically, it relates to SDG 5 "Gender Equality" - Achieving gender equality and empowering all women and girls. The circular economy integrated in the gender-responsive policies helps for the achievement of multiple SDGs [6], including:

SDG 3: Good health and well-being

Ensuring a healthy life and promoting well-being for all people of all ages

SDG 8: Decent work and economic growth

Promoting continuous, inclusive and sustainable economic growth, full and productive employment through the improvement of resource efficiency in consumption and production.

SDG 9: Industry, Innovation and Infrastructure

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation by adopting resource efficient technologies

SDG 12: Responsible consumption and production

Ensure sustainable consumption and production patterns

SDG 13: Climate action

Take urgent action to combat climate change and its impacts

SDG 16: Peace, justice and strong institutions

Promoting peaceful and inclusive societies for sustainable development, ensuring access to justice for all, and building inclusive, accountable and effective institutions at all levels

2.5 Evaluation of gender-responsive and green budgeting implementation efforts.

Considering that the gender-responsive budgeting is a required strategy to be implemented for the achievement of gender mainstreaming objectives settled in the appropriate documents at national level (SKBGJ) and organizational level (GEP), we have conducted a content analysis of these documents linked to the CE aspects with focus on the SDGs to be achieved and also to the gender and environment budgeting as effective tools for achieving these objectives.

When SDGs become part of the country's national policy framework, it is crucial that the process is then followed by SDG integration into the countries' budgetary frameworks [9]

Gender Responsive Budgeting has become a priority area in budget policies and programs mainly in recent years. Public funding for gender budgeting has been increasing since 2015, when it was at the level of 1% of total budget expenditures, and to reach a significant increase of 6.3% of total budget expenditures in 2019, and this is considered the highest figure budgeted in the country but also in the region according to official data [17].

In Albania, there is no "Green Budgeting" practice, this is because there is no mandatory regulatory framework for its implementation. Green budgeting is an innovative budgetary approach to help achieve the SDGs related to green and circular economy.

In the organic law of the state budget as well as in the annual budget laws, it has not yet been included in any budget program, with the title "Green Budgeting". Also, the budget funds for the protection of the environment are very low and in four years are presented from 0.23-0.18% of the total budget, this value is much lower than the countries of the Balkan region [5].

At the local level, Albania lacks funds and structures dedicated to the drafting of environmental policies. Only a small percentage of the budget goes to the environment, while the policies are drawn up by specialists in other fields, so there are no funds and structures dedicated to the drafting of environmental policies. It is recommended that the local budget institutions establish the necessary structures dedicated to the drafting of environmental policies, as well as to guarantee cooperation with other units [12].

2.6 Future challenges about Circular Economy development.

In the future, the commitment of the Albanian government will be in drafting policies and taking measures for a green economy and financial sector as follows [13]:

- Through the Medium-Term Strategy of Public Finance Management 2023-2025, it is intended to include green practices in the process of budget planning and implementation.
- Integration of green growth objectives in fiscal and budget policies
- Inclusion of the "green" component in all professional education curricula;
- The digital revolution will continue to develop rapidly in order to achieve through innovations the harmonization of financial systems with the Sustainable Development Goals
- Reduction of barriers for green financing, mainly for women according to the objectives set in the NSGE 2021-2030.

3. Methodology

This paper, referring to the literature review, seeks to examine the documents prepared by governments (NGSE 2021-2030, EU GAP III 2021-2025) for achieving gender equality regarding the inclusion of Circular Economy aspects in them. We tried to investigate the efforts to adopt a “Green Budgeting” comparing with the development of “Gender Budgeting”. Moreover, the work includes the evaluation of Circular Economy alignment with SDGs regarding the involvement of CE in NSGE 2021-2030. So in focus are the relations of CE with gender perspective and the treatment of CE concepts in the Gender-related national documents. This is a qualitative study and the methodology is based on a content analysis of the documents taken into consideration. Secondary data were obtained through literature review—from published sources such as guidelines and online research articles.

4. Conclusions and Recommendations

Albania has introduced officially only Gender Budgeting as a priority in MTBP, and Green Economy still remain a future challenge to be introduced legally in the government budgeting process. So, in this paper we emphasize the need that Green Budgeting in the near future becomes part of the Albania’s budgetary governance.

Gender Budgeting together with Environmental Budgeting form all the SDGs budgeting process. That’s why we suggest, as an added value for the government MTBP and UT GEP structure, that these documents needs to have a clear linkage with the respective SDGs to be achieved. We suggest also at governmental level to include at the annually progress/performance report an analysis of budget expenditures in line with SDGs, with focus on the achievement of gender equality and environmental goals.

Tax breaks targeted for women and girls in the SKBGJ will incentivize innovation and investment in the green economy sector, and is therefore an effective support for advancing women's empowerment and the circular economy as well.

In addition, now that the strategic goals of NSGE 2021-2030 are expanding with the inclusion of circular economy activities and in the near future with the adoption of "Green Budgeting", it must be appointed employees of green economy policies for full-time and dedicated only to their implementation. In all line ministries and municipalities in the country there are qualified and full-time employees who have this responsibility but also other responsibilities in their job descriptions.

A "good budgetary governance" requires that budget to be in line with the national strategic priorities. In Albania this proves that we are on the right track for having a "Good Gender Budgeting" process, but the efforts are nonexistent regarding the inclusiveness of green economy goals in a separate budget document. Studies have shown that, in contrast to the objectives of gender equality, forced by law to be integrated into the budgeting process, in relation to achieving other SDGs on environmental concerns, our country has not made progress.

The existence of a linkage between circular economy policies and legal requirements for green-related issues with resource allocations is important and necessary to translate the commitments into the adequate resources not just for the implementation of the "Green Budgeting" but for the progress of the "sustainable development and production" as well.

The interaction between CE, NSGE, GB and SDGs will ensure a fair and sustainable distribution of resources among men and women, an equitable and sustainable development and it will clarify that gender and environmental-related objectives are to be accomplished through the "gender-responsive and green budgeting".

To conclude, we recommend an inclusive national strategy and budgeting program regarding the very important considerations of equality and women's empowerment, and circular and green economy to support all the work of SDGs achievement. Gender-Responsive Budgeting and Green Budgeting serve to transform financing with respect to gender equality and green economy promotion and in the future the central and local government budgets tend to be more effective and "sustainable" as they will respond to women's priorities and environmental protection.

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Implementation of Total Quality Management (TQM) in the banking sector in North Macedonia

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Abstract

Total Quality Management we can defined as a transformation in management process that constantly increase customer satisfaction via the design and perfection of organizational and the process of a system. A literature about Total Quality Management is new in area of academic and research sector last years and the process of implementation is little bit hard in market in North Macedonia, especially in sector of banking system. A mix approach war applied in financial services industry in public and private sector to achieve e results in this research paper with the participant of consultant especially in banking sector, contractors , clients, employees and the academic view from various platforms of banking sectors. A total of 420 valid responses has been for data analysis. The reason of this research paper and the results of this study is to identify the current Total Quality Management implementation status in sector of banking sector and regulate that the questionnaire war reliable. The findings in this research paper exposed that an effective Total Quality Management implementation in sector of banking and financial sector involve abundant management commitment, customer satisfaction , leadership, teamwork, services to clients etc. Results of this research paper provide that Total Quality Management is new for the market of financial banking sector, but with significant awareness into the components that empower the implementation. This study in same time will contribute to understand the situation of Total Quality Management in sector of financial banking system demonstrating their capacity to enhance the North Macedonian financial sector. Expect this, and for further studies can contribute for more details and other results for next research paper or case studies.

Key words – Financial sector, total quality management, banking

Introduction

In North Macedonia financial banking sector is one of the most important sectors of economic development, especially after the independent and applying free market model in economy, the banking sector is one of the important sector that contribute in process of economic growth of the country and is in process of applying the conditions of new strategies, new technologies, follows digitalization trends etc. As a result the financial system must generate new technologies, new trend of services and new methodology of management to remain competitive in the financial market and succeed in their operations.

Most of the research paper and other studies are international and for North Macedonia do not have more. In market of North Macedonia Total Quality Management can be found more in sector of small and medium companies, especially in trading market, produce, industrial sector but in banking system do not have so many research papers. Presently, the usage of Total Quality Management system in numerous banking system in North Macedonia is an improvement, but then the conventional system unable to survive with the challenges occur were not competent to overcome of the challenge.

In theory Total Quality management consists of several quality instruments and technique, in addition to various values and beliefs that all staff within the same organization shares (Abdaziz, 2015). TQM can be defined as a strategy that aims to generate and transfer more efficient and superior services, through achieving cooperation between organizational members (Lakhal, 2006). After 1990 the banking system has had the classic format of organizational and management system from the previous political system when all the banking organization was under the state impact. Despite the fact that Total Quality Management has been around for 15 years, with well-documented advantages and significant government backing, the rate of implementation and use is still modest and falls short of the government's aim. In this case, various studies were showed in order to differentiate the report between practices of total quality management and the performance in banking system which is the main reason of this research paper. The space of the examination comprises various kinds of industries and sectors such as financial, operational services and quality performance. Such studies designated that there are positive reports between the current implementation of Total Quality Management and the organizational performance, in which when one organization applies total quality management practices in effective way then it's organizational and employees' performance will largely superior. Mile Terziovski clarified that there is an important influence and impact of total quality management on operational performance especially at large companies and banking system that are specialized in manufacturing processes and services. (Milé Terziovski, 1999) Several categories of total quality management were considered as an essential performance predictors such as leadership, individual management and focus on customer. This paper discusses on total quality management practices and its influences on organizational performance.

Literature review

The quality management concept was predictable since ancient times in Japan in the late 1930s specifically after the World War II. After that, several firms in the manufacturing sector were focused on enhancing quality and utilizing tools that directly aim to control quality at these firms (Demirbag, 2006). Although the literature on Total Quality Management includes a rich

spectrum of works, there is no consensus on the definition of quality. The notion of quality has been defined in different ways by different authors. Gurus of the Total Quality Management practices such as Garvin, Juran, Crosby, Deming, Ishikawa and Feigenbaum all provided their own definitions of quality concept and Total Quality Management. (G.S.Dangayach, 2005)

Also, literature review further shows that measuring service quality is not an easy task and lot of problems are there in measuring it. Most forms of measurement of service quality focuses on customer satisfaction. (Jr., 1992). Various techniques were also proposed for QM practices, in which it is considered as a method to enhance quality and efficiency of different industries services and products. One of the main internationally accepted approaches is total quality management in which this approach essentially attempts to create a comprehensive cooperation between all organization functions in order to fulfill customers' demands in an efficient way and to achieve all organizational goals. (Faisal Talib¹, 2012)

Research methodology

This study used a combination of qualitative and quantitative data gathering techniques for examination objective. To evaluate the present status of Total Quality Management implementation in the banking sector and financial institutions in North Macedonia for period of 2012-2021 comprehensive structured interviews and a questionnaire survey were undertaken for the result of the study. The questionnaire was tested and applied on a specified sample in all the management of banks of North Macedonia that are operating in financial market. Participants were asked to access and comment on the template of questionnaire that were prepared and from the results , underscoring its validity and relevance to the objectives of the research paper. In general, all the banks agreed that the questionnaire will be effective in achieving the goals of the study. Research aims and objective of this research paper are to explore the Total Quality Management practice and technologies, to identify the impact and effects of Total Quality Management implementation on the banking sector from the period that we have got the situation of banking service evolution and to generate a guidelines for the effective implementation of Total Quality Management practice into banking system in North Macedonia.

Results and discussion

From the view of all services industries, service quality remains a critical issue in maintaining and propagating business in the competitive marketplace. To increase the profit, to be part of the market with high level of quality and to be competitive in financial market banks must provide Total Quality Management and need to provide customer high quality services. In free markets , especially in financial market , customers demands quality services.

From the research paper and from the result of questionnaire we have get results that banking system must accept to apply quality management process to be part of high quality service sector, even some of the banks are applying from 2012. In banking, quality means not just meeting but exceeding customer expectations. For this reason, service quality is viewed as an emerged from the growth of the internet and information systems. The growth in internet-based services has changed the way that banks and customers interact. (Talib, 2013) E-service is conceptualized as an interactive information service that provides a means to organizations that can build its service offerings and develop a competitive advantage. The basic reason behind

development of online services was the cost reduction and to delight customers through automation. Although firms gained efficiencies from online business/e-commerce/selling online, their failure to focus on customer needs and wants, resulted in poor online service performance. The article by Liu and Arnett, considered the four quality factors as major ingredients for the success of website as: system use; system design quality; information quality and playfulness.

This section reviews the implementation of Total Quality Management in banks. Use of Total Quality Management in the banking is not too old, earlier studies shows that Total Quality Management approach in the banking is a recent trend and is showing better performance after its implementation. Total Quality Management, which is about total customer service and continuous customer satisfaction, is applicable to almost all service industries including banks where the customer is treated as king. In fact, customers in service industries, especially in the banking, are rather more sensitive to quality and delivery of service than their manufacturing counterpart as they are in direct contact with the service providers . Therefore, adoption of Total Quality Management program in the banking sector may be one of the best alternatives that care about improved service quality and higher customer satisfaction together with retaining its customers.

So, from the result of the questionnaire on figure 1 its showed the implementation of Total quality management from all the banks in North Macedonia, some of the banks are implementing from 10 years some last years.

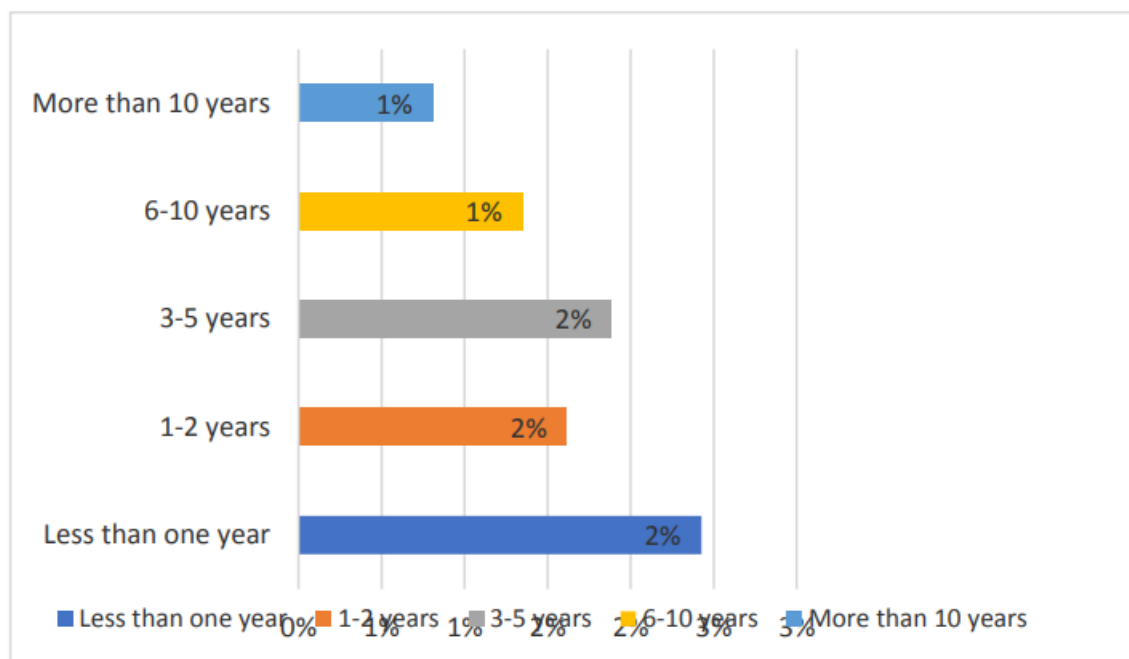


Figure 1 – Period of Implementation of Total quality management in banking sector in North Macedonia

And at the Figure 2 its showed the awareness of implementation of Total quality management in banking sector

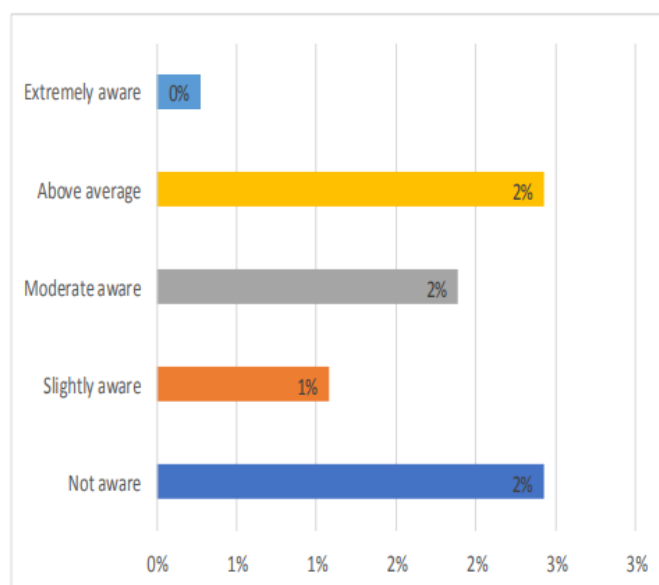


Figure 2 – Awareness of Total Quality Management Implementation in banking sector North Macedonia

The understanding of Total quality management deployment and growth in banking sector has a considerable influence on top management decisions to convert to a Total quality management -based approach. Total quality management deployment is a complex mission that requires several pieces of information from different stakeholders but understanding the mechanism will assist in controlling the challenges of implementation. This study has assessed the consciousness of participants of Total quality management procedure application. Most respondents are unaware of the Total quality management method. However, if the banking sector has a better track reputation than the public sector or other sector, this does not imply that the private sector is higher conscientious. The heterogeneity in this rate may be attributed to differences in the contributors from each market. The percentage of practitioners in both fields who have a positive technology view deployment and procedure. Banks and other financial institutions (micro credits) in North Macedonia tended to increase their interest in Total quality management and other resources by participating in CIDB-related initiatives. Several participants suggested that the North Macedonia government include a detailed directory to understand Total quality management application policy and how different organizations should handle Total quality management projects. Furthermore, Total quality management applications should be permitted in the public and private sectors accordingly.

Conclusions

Through peer literature evaluation, the study aids in understanding the current state of Total quality management and its implementation in the banking and financial system in North Macedonia. Total quality management can be considered as a source of long-term competitive advantage. The main purpose of this study is to identify the existing state of Total quality management application in the banking and financial sector, as well as the level of awareness of Total quality management implementation in same projects of financial services like banking or others. Despite having access to these tools, Total quality management employment in the banking system and financial services is still severely insufficient. Total quality

management implementation and awareness were addressed from the perspectives of qualified professionals, and recommendations were made as a result. The most noteworthy finding of the study is that Total quality management acceptance is still low in North Macedonia public and other financial sectors. The majority of the companies and banks surveyed are not applying Total quality management at all but they know about the importance for the market, and their workers are not fully committed to the definition. Furthermore, this study helps industry practitioners better comprehend the responsibilities of Total quality management and its capacity to improve project performance. As a result, it is proposed that focused seminars, talks and training to support Total quality management explain the process of Total quality management implementation rather than merely promoting the incentives and benefits of the application. This study, without a doubt, has some limitations. Future studies should include more investigation into the critical success drivers of Total quality management adoption in the banking sector, financial services in North Macedonia. As a result, Total quality management in a company, especially in the banking sector, must be highly concerned.

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Rethinking regarding circular economy

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Abstract

Ellen MacArthur Foundation estimates that around 80% in the consumer goods sector is lost on annual terms. Hence, the linear economic model (take-make-waste) cannot be anymore an appropriate model considering the growth population, the limited resources, etc. Therefore a new economic model is emerging and developing in a very fast pace. This is what we call circular economy. This model aims at effectively manage materials stream and the use/reuse of products as long as possible. Such a model creates opportunities for businesses and at the same time positively impacts the environment and promotes economic growth. Besides all benefits that circular economy yields, still there is a lack of awareness about these benefits from different stakeholders including governments, civil society organizations, businesses, universities, etc. Besides the efforts sporadically taken by various researchers, still there is a need of coordinated effort toward a better promotion of circular economy, as an indispensable new economic model.

This paper aims at introducing the concept of circular economy and providing a more comprehensive overview of the benefits of this novel economic model. In addition, this paper provides the status quo of this model in Albania, accompanying with some success stories. More outlines various definitions of circular economy. Moreover, the benefits of this economic model are elaborated. Second part provides a general landscape of circular economy in North Macedonia, its legal framework and the first efforts of the Albanian and North Macedonian government to incorporate the concept into the draft strategy of waste management.

There are some conclusions and recommendations at the end of the paper.

Keywords: Circular economy, Management model, Albanian legislation, North Macedonia legislation

Jel Code: M11, O38, N64

I. About circular economy

i.1 The definition of circular economy

Since the Industrial Revolution took place (in the late of 18th century), the widely used economic model has been the linear economy. This economic model is supposed to extract the virgin raw materials and then process them into products. These latter are then re-laid to customers who fulfill their needs depending on the case and then they throw them away. In the best case, these disposed products are landfilled or incinerated with the purpose of recovering them or specific parts of the products (Ellen MacArthur Foundation, 2013). The philosophy of this model is “Take-make-consume-dispose”. This is a simple landscape of how linear economy works. Contrary to this, a new economic model has flourished named circular economy (CE) which is also known as closed loop. Unlike the traditional economic model, CE aims to utilize as much as possible products, their components and materials (Ellen MacArthur Foundation, 2012). The outline of the CE is displayed in Figure 1. CE is composed by two typologies of cycles, that of technical cycles and biological cycles. In both cases, the overarching goal is to limit the leakage of resources as much as possible.

Other authors have provided other definitions who best describe the way CE works: “*a CE is comprised of activities that reduce, reuse and recycle materials in our production, distribution and consumption systems (Murray et al., 2017) in ways that narrow, close or slow resource loops (Bocken et al., 2016; Stahel, 1981).*”

European Union comes with another definition about CE, which define it as “*a model of production and consumption, which involves **sharing, leasing, reusing, repairing, refurbishing and recycling** existing materials and products as long as possible*”. Realistically, it insinuates ^{reducing waste} as much as possible.

There is wide variety of articulating the CE. We restrain ourselves to the definitions of MacArthur and EU. Drawing on the above-mentioned definitions about CE, we highlight the two fundamental principles of the CE: (i) *Closing of resources*: The close of cycles pave the way of retaining higher value of products and materials. The underline point is different stakeholders to enhance cooperation in order to realize value retention and value creation. (ii) *Maximize the utilization of functionality*: A maximum reuse of product and material as long as possible, creates ground for a higher retaining of value.

As a conclusion to this first general overview of the CE definition, the fundamental purpose of the CE is to reduce waste to a minimum. It means that when a specific product reaches the end of its life, the goal is its materials to remain in the economy, wherever possible. The idea is to use them in a productive way and use it as much as possible, in order to create value.

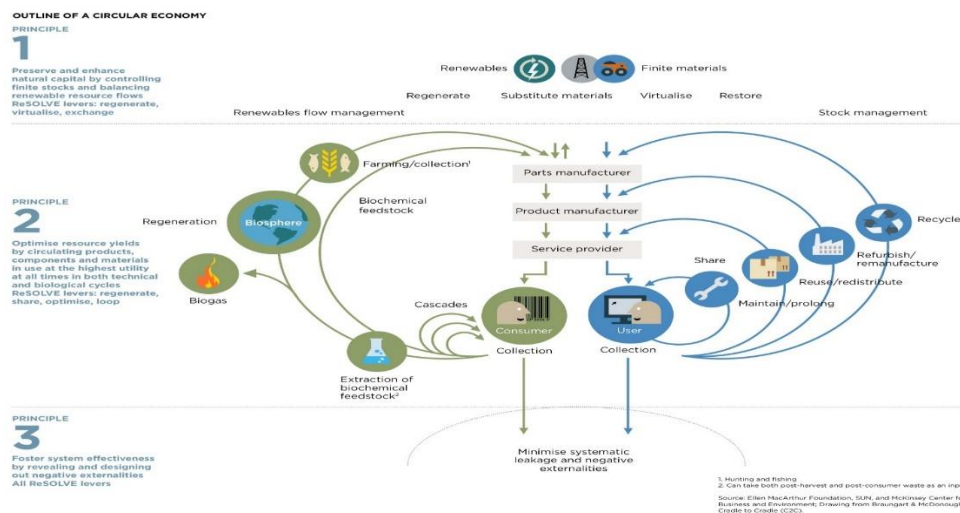
i.2 Benefits of moving toward a CE pattern development

Approaching toward the CE, could have opportunities but challenges, too. As following, the potential opportunities and challenges are enumerated.

i.2.1 Environmental benefits

The fundamental purpose of moving toward a CE pattern is to reduce at a maximum the negative effects into the ecosystem and environment. Different studies have confirmed that CE has the potential to have such positive impact. In specific terms, the CE benefits in the framework of environment protection include:

Figure 1: Outline of CE



Source: Ellen MacArthur Foundation (2015).

Fewer emissions: the pursuit of CE principles, will produce a reduction of greenhouse gas emissions.

Land productivity and soil health: The implementation of CE principles require to no longer exploit land and ecosystems but to make sure that key nutrients are returned into the soil thus reducing as much as possible waste.

Fewer negative side effects: By combining the upper two benefits, a few negative externalities will happen, such as land use, water, air and soil pollution, emission of toxic substances and climate change (Ellen MacArthur Foundation, 2016).

i.2.2 Economic benefits

In general terms, the CE paradigm offers several economic benefits to the system which are enumerated below.

Economic growth: McKinsey & Co. has calculated that economies which operate under the CE principles experience higher economic growth.

Substantial resource savings: Businesses that operate under the framework of CE principles, have the potential to save over 70 % of their materials when compared with raw material extraction in business-as-usual model (Ellen MacArthur Foundation, 2014).

Employment growth: Several empirical studies (e.g. the Ellen MacArthur Foundation, SUN, and McKinsey) have revealed that moving toward a circular economy will have tremendous effects into on employment. Specifically, more job will be created through the increase in labour-intensive high quality recycling and repair practices, an increase of number of jobs provided in the logistics sector by locally taking back products, an increase in new businesses through innovation, the service economy and new business models.

Incentives for innovation: CE is a new way of thinking. Said that, it means that CE adoption requires innovative solutions. The comprehensiveness CE asks for, motivates the interdisciplinary collaboration between designers, manufacturers and recyclers and sustainable innovations (Kraaijenhagen, Van Oppen & Bocken, 2016).

i.2.3 Benefits for businesses

CE benefits could be considered by various perspectives. By approaching the economic activities toward CE principles, businesses could have benefits also. The Ellen MacArthur Foundation (Ellen MacArthur Foundation, 2015). has categorized these benefits into four pillars described as below.

New profit opportunities: This will provide chance to businesses to decline their material costs and could gain new opportunities in new markets. These opportunities could stem from: more opportunities for growth and productivity; the creation of new markets; more value added for consumers; spending less energy and waste reduction (WBCSD, 2011).

Security of supply: A circular economy gives opportunity to spend less raw materials and use more recycled materials. This establish an efficient system and increases their value throughout the lifetime of products. Consequently, the cost of materials will be reduced (Ellen MacArthur Foundation, 2015; Kraaijenhagen, Van Oppen & Bocken. 2016).

Demand for new service models: The execution of CE principles increases chances for having a higher demand. As far as the implementation of this business model provides new services, this will get translated into the creation of new jobs. It is worth highlighting that businesses that seize these opportunities in a timely manner could create a competitive advantage.

i.3 Circular economy-a new model of doing business

Nowadays, businesses are increasingly facing with the lack of resources as they are becoming more and more scare. This impacts the new materials price and consequently the cost of businesses. So, they need to find innovative ways in order to turn this materials scarcity into a competitive advantage. One manner to do that is through the close of their production loop. There are studies that showcase the benefits of this loop closing. A 2012 research from Ellen MacArthur Foundation estimated that the EU manufacturing sector could realize net materials cost savings worth up to 630 billion USD annually. This get businesses into a new business model which is worth to all actors of the network and the society overall. A business model is the way firms create and distribute value (Amit and Zott, 2011). It consists of three components: (i) Value creation; (ii) value organization and; (iii) revenue model.

The first component underlines the added value not only from the financial perspective but socially and ecologically as well. The second component describes the way this value creation is organised either within a single organisation or in some cases amongst multiple parties. The third element relates to the revenue model or models whereby the costs related to the organisation of the business model are interconnected with the revenues generated from the value proposition. A circular economy requires a wide cooperation between multiple actors in order to realize a value cycle. In addition, in this case the concept of value creation is widened so to capture not only the financial value but also the ecological and societal value creation. To make this multiple value creation happen, an appropriate strategy has to get implemented which on the other hand should be supported by the right revenue model.

ii. Circular economy in Albania

Albania and the European Union (EU) have signed the Stabilization Association Agreement (SAA) in June 2006. The SAA entered into force in April 2009; the document reflects Albania's path towards EU membership. The Republic of Albania has been awarded the official candidate status for accession to the EU in 2014. The aspiration to become member of EU "obliges" Albania to gradually align legislation with the *EU Acquis*, including the area of environment and especially waste management.

ii.1 Legal framework for circular economy in Albania

The issue of *waste management* has been theoretically an important point included into the government agenda. However, concrete steps toward this issue, has been rarely taken. The Albanian government for the first time drafted a National Waste Management Strategy in 2010. The latest “National Integrated Solid Waste Strategy” which is still draft and not yet approved, is designed for the period 2018-2033 and is quite far improved and aligned with the EU Waste Framework Directive (WFD). This draft strategy is the main document regarding municipal waste management, non-municipal and hazardous waste in Albania. The strategy underline purpose is to first provide evidences that Albania has the full capacity to align with the EU policies (Chapter 27 on the Environment) in this area and secondly to update policies and the National Plan for Integrated Waste Management. The strategy is planned for a five years' term and contains objectives and measures that depends on domestic and foreign financial sources.

The document has been designed considering the infrastructural developments that have been taking place in the sector during the last 7 years, both undertaken from the central and local government. Besides the local context, the draft strategy has been referring to other countries which have gone through the same pathways to become a EU member. As a conclusion, it is worth highlighting that the strategy considers the importance of waste management according to the principle of the circulating economy in order to have a complete protection of natural resources and enhance the efficiency of the use of products.

The strategy points out several ambitious objectives Albania has pledged to achieve under the indicated timeframe. In specific terms, “Albania is pledging in the next 15 years to achieve 60% recovery and 50% recycling of packaging waste, reduce the bio waste by 70%, recovery

and recycle non less than 70% of all other types of municipal waste leading towards better land, water and air protection”.

In addition of the strategic orientation, Albania has designed a solid legal framework in alignment with EU standards. Several laws and directives have already converted that strategic orientation into a legal framework, including a law No.10463, date 22.09.2011 “On the integrated waste management”. An effort to align the Albanian legislation with the EU directives, has already taken place in Albania.

Table 1: Unification of Albanian legislation with the EU Directives

EU	Albania
EC Framework Directive 2008/98 on Waste (19.11.2008)	Law 10463/2011 “On integrated waste management” By-Laws on Differential Collection of Waste at Source (DCM 408, 25.062008) National Waste Management Plan 2010 - 2025
Directive 94/62 / EC on Packaging (20.12.1994)	DCM no. 177/2012 on Packaging and Packaging Waste
Directive 99/31 / EC on Waste Landfills (20.04.1999)	DCM no. 452/2012 on Waste Landfills
Waste Incineration Directive 2000/76 / EC (04.12.2000)	DCM no. 178/2012 on Waste Incineration

Besides the positive steps undertaken from the Albanian government in terms of legal and institutional framework, a wide gap is seen between legal steps and reality. There are several reasons that cause this situation starting from *shortcomings in resources, capacities, technical knowledge and environmental education*.

The situation of circular economy in Albania has been highlighted into the European Commission Strategy Paper. Specifically, paper emphasises that ‘*Waste management remains a major challenge, including increasing recycling performance and providing for better services to the public. Illegal dumping and not adequate legal dumping sites pose threats to environment. The switch to circular economy principles and goals with measures covering the whole cycle: from production and consumption to waste management and the market for secondary raw materials will help the country boost its global competitiveness, foster sustainable economic growth and generate new jobs. The aim is to contribute to "closing the loop" of product lifecycles through greater recycling and re-use, by this bringing benefits for both the environment and the economy*’.

ii.2 Key responsible actors of waste management process

Different state institutions and organizations participate and have different responsibilities in the area of integrated waste management in Albania. Some of the responsibilities have been

assigned to several ministries as defined in in Law 10463 "On Integrated Waste Management", while specific responsibilities are assigned to municipalities under the new Law 139/2015 on Local Government.

Central government responsibilities

Law 10463 "On Integrated Waste Management" is the basic legislation defining institutional responsibilities in the field of waste management. In addition, other legal acts, which were later developed for the implementation of the Law, have defined detailed institutional responsibilities between central government institutions, including the Ministry of Tourism and Environment (MTE), the Ministry of Infrastructure and Energy (MIE):

- DCM no. 509, dated 13.9.2017 "On the definition of the area of state responsibility of the Ministry of Tourism and Environment".
- DCM no. 504, dated 13.09.2017 "On determining the area of state responsibility of the Ministry of Infrastructure and Energy".

However, upon the latest national elections which took place in June 2017, these responsibilities have changed. As the Ministry of Urban Development no longer exists, the responsibilities of this ministry have been distributed to the Ministry of Tourism⁶⁸ and the Environment and the Ministry of Infrastructure and Energy⁶⁹

The Ministry responsible for the Environment (currently the Ministry of Tourism and Environment - MTM)⁷⁰ is responsible for the development of policies and general aspects of waste management. In cooperation with other institutions, MTM is the institution responsible for policy development, legislation, drafting and implementation of the National Strategy and Action Plan for Waste Management. Together with other subordinate institutions, including the National Environmental Agency (KTA) and the State Environmental and Forestry Inspectorate (SIIH), the Ministry has full responsibility for the establishment and monitoring of the implementation of the waste management system at regional and local level.

Local government responsibilities

Law no. 139/2015 "On Local Self-Government" defines the responsibilities and authority of the level of LGUs. This law regulates the organization and functioning of local government units and relevant bodies in the Republic of Albania, as well as defines their functions, competences, rights and duties.

Specifically, "collection, transport, destruction and treatment of municipal waste" is defined as a responsibility of municipalities. Under this definition, municipalities have the right and responsibility for:

⁶⁸ VKM nr. 509, datë 13.09.2017 "Për përcaktimin e fushës së përgjegjësisë shtetërore të Ministrisë për Turizimin dhe Mjedisin"

⁶⁹ VKM nr. 504, datë 13.09.2017 "Për përcaktimin e fushës së përgjegjësisë shtetërore të Ministrisë për Infrastrukturën dhe Energjinë".

⁷⁰ VKM no. 509 13/09/2017 "Për përcaktimin e fushës së përgjegjësisë shtetërore të Ministrisë së Turizimit dhe Mjedisit"

Organization for the provision of waste collection, transportation, treatment and disposal service;

Setting service fees to cover service delivery costs and revenue collection,

Organize and distribute the waste management service on its own and / or in cooperation with one or more other municipalities, using all legal and administrative instruments.

Specific tasks for municipalities which are mainly related to planning, monitoring and reporting, but not management, are set out in Law 10463/2011 "On Integrated Waste Management". But this law does not clearly specify the specific responsibilities of local government units for management and administration in accordance with the definition of the law on local self-government, which stipulates that the collection, transportation, handling and disposal of the MNB as a function of the municipalities themselves.

iii. Circular economy in republic of North Macedonia

Republic of North Macedonia and the European Union (EU) have signed the Stabilization Association Agreement (SAA) in April 2001. The SAA entered into force in June 2001; the document reflects North Macedonian's path towards EU membership. The Republic of North Macedonia has been awarded the official candidate status for accession to the EU in March 2020. The aspiration to become member of EU "obliges" North Macedonia to gradually align legislation with the *EU Acquis*, including the area of environment and especially waste management.

iii.1 Legal framework for circular economy in Republic of North Macedonia

The Law on Waste Management has been in force since 2004 and thus pre-dates both the EU Waste Framework Directive's revisions in 2008 and 2018, and does not include the waste hierarchy nor recycling targets for municipal waste (Ministry of Environment and Physical Planning, 2021). The national waste management strategy (NWMS) 2008-2020 was revised in 2021 and the new NWMS will cover the period 2021–2032. There is also a draft national waste management plan (NWMP) for 2020-2026. The NWMP is currently undergoing a strategic environmental assessment and has not been adopted yet. In addition, all eight regions have regional waste management plans for a period of 10 years and 81 municipalities have municipal waste management plans. There is a need for more political will to improve the current situation regarding waste management and the enforcement of the regulations. Allocation of financial resources for building and improvement of infrastructures are necessary for improving waste management. Furthermore, investment is needed to improve public awareness of the importance of recycling and the separate collection of waste.

In addition of the strategic orientation, North Macedonia has designed a solid legal framework in alignment with EU standards. Several laws and directives have already converted that strategic orientation into a legal framework, including a law No.07-3718/1/2004, date 15.09.2004 "On the integrated waste management". An effort to align the North Macedonian legislation with the EU directives, has already taken place in North Macedonia.

Besides the positive steps undertaken from the North Macedonian government in terms of legal and institutional framework, waste management system is characterized by a rather low recycling rate and a high reliance on land filling. The main system for waste collection in North Macedonia consists of brings points with containers for residual waste collection.

Table 2: Unification of North Macedonian legislation with the EU Directives

EU	Republic of North Macedonia
EC Framework Directive 2008/98 on Waste (19.11.2008)	Law 07-3718/1/2004 "On integrated waste management" Law 216/2021 from 17.09.2021 National Waste Management Plan 2008 – 2020, 2020 - 2026.
Directive 94/62 / EC on Packaging (20.12.1994)	161/09 on Packaging and Packaging Waste
Directive 99/31 / EC on Waste Landfills (20.04.1999)	1999/31 on Waste Landfills
Waste Incineration Directive 2000/76 / EC (04.12.2000)	

iii.2 Key responsible actors of waste management process

Different state institutions and organizations participate and have different responsibilities in the area of integrated waste management in North Macedonia. Some of the responsibilities have been assigned to several ministries as defined in Law 07-3718/1/2004 "On Integrated Waste Management", while specific responsibilities are assigned to municipalities under the new Law 139/2015 on Local Government.

Central government responsibilities

Law 07-3718/1/2004 "On Integrated Waste Management" is the basic legislation defining institutional responsibilities in the field of waste management. In addition, other legal acts, which were later developed for the implementation of the Law, have defined detailed institutional responsibilities between central and local government institutions.

The Ministry of Environment and Physical Planning (MoEPP) is the waste management regulator and is responsible for policy development, planning, licensing, data collection and treatment, and the coordination of cooperation among all institutions involved in waste management. Public communal enterprises and private companies that deal with waste collection and transport must have a license issued by the MoEPP.

There are several departments under the MoEPP involved in waste management (Eunomia, 2017):⁷¹

- The Department of Waste approves the waste management plans and programs of municipalities and also undertakes all permitting activities related to waste management.
- The Macedonian Environmental Information Centre collects and analyses annual reports on waste management operations issued by the municipalities and reports waste statistics.
- The Department of EU Integration is involved in transposing the EU legislation, including waste-related legislation.
- The Department of Cooperation with Municipalities assists the local authorities in implementing environmental legislation.
- The Department of Integrated Pollution Prevention and Control (IPPC) is responsible for closing non-compliant landfill sites and issuing permits for compliant sites.

Local government responsibilities

Law no. 05/2002 "On Local Self-Government" defines the responsibilities and authority of the level of LGUs. This law regulates the organization and functioning of local government units and relevant bodies in the Republic of North Macedonia, as well as defines their functions, competences, rights and duties.

Specifically, "collection, transport, destruction and treatment of municipal waste" is defined as a responsibility of municipalities. Under this definition, municipalities have the right and responsibility for:

Organizing the collection, transport and disposal of municipal wastes;

supervising transport;

Deciding on the location of waste management facilities, establishing landfills and terminating illegal dumpsites;

Issuing local regulations on waste management;

Financing and supervising dump/landfill closures

The MSW management system is based on a regional division; the regions must comprise at least 200 000 inhabitants. Waste management regions are responsible for the organization of regional waste management services. North Macedonia is divided into eight statistical regions, and the municipalities in each region must establish an inter-municipal waste management board Municipal waste management in North Macedonia Page | 10 (IMWMB) and a regional waste management center (RWMC), which represent a link between the state and local communities (Eunomia, 2017).

⁷¹ European Environment Agency, European Topic Centre on Waste and Materials in a Green Economy, Municipal waste management in Western Balkan countries – Country profile North Macedonia, p.9-10.

MSW management is the responsibility of municipalities, which they usually fulfill through public communal companies, mostly owned by the municipalities. These waste management companies conduct waste collection services and disposal of waste. Separate waste collection is conducted by private (licensed) operators. Packaging and packaging waste management is performed by collective and individual (licensed) operators under the EPR scheme.

iv. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the above, we can draw the following conclusions

The circular economy has some successes in Albania, although Albania is not in the vanguard of countries using circular economy.

The beginnings of the circulating economy in Albania were observed even before 1990 but they were due to the survival needs of low-income state-owned enterprises and the need to employ all active labour force.

The transition from the linear economy to the circular economy in Albania did not come from the promotion and support from government policies but from the needs of businesses to respond to the actual challenges of doing business and the intuit of innovative businessmen to be the most successful in their business field.

In a few cases the circular economy initiatives in Albania have been sporadically supported by projects and donations from international institutions.

The state does not focus on the circular economy itself and does not have even a draft strategy in this regard. Also, there are no incentives to promote a business model based on the circular economy, neither financial nor other incentives in both countries.

Business cases that apply the circular economy model are going to be increased year by year, indicating that business is on the right track to respond to the needs of the competition beings successful.

In order to comply with the Circular Economy Package, North Macedonia will need to monitor the introduction of production processes and standards in order to minimize source waste and improve the recycling rate of used products. Successful compliance with the new regulations will require improved cooperation activities and shared responsibilities among all stakeholders.

Recommendations

To better respond to contemporary developments and new business models, we think that the following recommendations are in place.

The government should draft a strategy for the circular economy as soon as possible and other legal acts for its implementation should be adopted.

Government policies including different incentives for businesses applying the circular economy model should be designed, taking into account first of all financial incentives but also

other incentives providing ease of doing business and facilitating and mitigating various procedures.

The international institutions should make donations (full or partial) to businesses that want to invest in a circular economy model. These donations should be in the R&D phase and in the stages of making the relevant investments.

A greater awareness of the public and especially businessmen about the circulation economy model should be made because our research showed that over half of business association executives had no knowledge of the circular economy.

The introduction of EU regulations and standards requires new complementary waste management mechanisms, especially economic mechanisms.

Traditional inspection methods will need to be supplemented with new enforcement mechanisms based on preventive measures.

There is an urgent need for improved protocols and an integrated system for data collection and reporting on waste management.

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Asset management and new investment opportunities

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Abstract

The Republic of Kosovo, is a developing country with the youngest population age in Europe, is currently characterized by the highest unemployment rates in Europe and is one of the countries with the largest number of international immigrants in the world.

Bearing in mind that a large number of our compatriots live and operate everywhere in the world and are also the promoters of households in Kosovo, the opportunity to invest in their homeland should be created.

In many cases, one of the reasons of non-investment from abroad is the real malfunction of the judicial system and the malfunction of the commercial court, lack of electricity, double taxation, inadequate professionalism of young people for the labor market, corruption, etc.

The purpose of this paper is to show data on the investments of our citizens living in the diaspora and government's strategies for Investments in Kosovo and the transformation of the linear economy into a circular one

The objectives of this paper are:

Identification and analysis of policies and strategies for foreign investments.

The causes affecting of implementation delays of the circular economy in Kosovo.

The methodology used in this scientific paper will be quantitative, whereas the research will be exploratory (finding) and evaluative.

The main databases that I will use are: KAS (Statistics Agency of Kosovo), Technology and Innovation), Ministry of Internal Affairs (MIB), CBK (Central Bank of Kosovo), etc.

Keywords: investment, employment, compatriots, strategy, circular economy.

INTRODUCTION

In the third quarter (Q3) of 2021, the total population in Kosovo estimated in 2021 is 1,798,187, of which, males were 905,128 whereas females were 893,059

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Table 1. Classification of the labor market for Kosovo population, (Q3) 2021ⁱ

	Percentage	
The population in Kosovo	1,798,187	100
Male	905,128	50.3
Female	893,059	49.7
Working age population (15-64 age)	1,231,695	68.5
Labor force (active people)	483,465	39.3
Non-active people	748,230	60.7
Labor force among young people (15-24 age)	70,715	14.6
Employed (in relation to active people)	383,304	79.3
Unemployed (in relation to active people)	100,161	20.7

If the population living abroad on April 1, 2011, is taken as a basis (703,978 inhabitants are estimated to be living abroad), at the end of 2021 it is estimated that over 847,256 inhabitants or 47.8% of the population of Kosovo lived abroad.

The balance of international migration (net migration) in Kosovo for 2021 was 38,606 inhabitants or 2.18% of the resident population. Period of 2019-2021, it is estimated that 86,363 residents left Kosovo or about 4.86% of the country's population, including doctors, teachers, nurses, soldiers of the Security Forces, etc.

Table 2. Migration flows: immigration, emigration and net migration for 2019-2021

Year	Immigration	Migration	Net migration (absolute no.)	Net migration (percentage)
2019	6,066	34,911	-28,845	-1.62%
2020	11,543	8,724	2,819	0.16%
2021	4,122	42,728	-38,606	-2.18%

The last Census of Population, Family Economies and Housing in Kosovo held during 2011, according to KAS (Statistics Agency of Kosovo) has shown that the population in Kosovo is 1,798,645 resident inhabitants, while from the estimate of the population in 2019, the number of residents was 1,782,115. From the 2011 population estimate and other data used from various sources, the causes of emigration in recent decades have been analyzed.

The number of Kosovar immigrants during 2020 is estimated to be a total of 8,724 inhabitants, including legal and illegal immigrants. The vast majority of immigrants for 2020 were legal immigrants. Legal immigration was due to: family reunification, marriages, finding a job,

permanent migration (mainly to neighboring countries), also employment long-term studies, etc.

Except to the EU and EFTA countries, a number of Kosovars had also emigrated to other countries, mainly to the USA, Turkey, Canada and other countries (2020 population estimate ASK).ⁱⁱ

The remittances of expatriates (figures in millions of euros) published by CBK (Central Bank of Kosovo) are as follows:

Table 3. Immigrant shipments – according to channelsⁱⁱ (in millions of euros, non-cumulative statistics).

Description	Total migrant remittances			
		Banks	Fund transfer agencies	Others
2004	357.0	.	.	.
2005	418.0	.	.	.
2006	467.2	135.1	184.7	147.3
2007	588.5	156.5	226.8	205.3
2008	608.7	126.3	213.1	269.3
2009	585.7	148.8	213.1	223.8
2010	584.3	141.3	213.1	229.9
2011	492.5	93.9	220.2	178.4
2012	516.4	92.6	236.7	187.0
2013	573.4	115.4	250.3	207.7
2014	622.3	115.2	281.6	225.4
2015	665.5	121.1	303.3	241.1
2016	691.0	116.3	324.4	250.3
2017	759.2	120.4	363.7	275.0
2018	800.6	123.1	387.5	290.0
2019	851.5	122.9	420.1	308.5
2020	980.0	141.3	672.0	166.6
2021	1,153.4	178.8	664.1	310.5

If we refer to the data of the Central Bank of Kosovo, we notice that only in 2022, the remittances of our emigrants were 1.44 billion euros, without direct investmentsⁱⁱ. Remittances in most cases are used for consumption, for investments in real estate and least in production.

KAS has developed the Survey for Statistics of Investments in Enterprises in the entire territory of the Republic of Kosovo, mainly in companies that have declared Investment Purchases in the annual amount of over 50 thousand Euros.

According to the results of the survey, at the country level, investments in construction occupy the main weight with 52.68% of investments. Meanwhile, other investments that occupy a significant weight are those in: machinery and equipment (37.27%); investments in tangible assets (6.46%); investments in intellectual property products (3.56%), as well as cultivated biological investments and greenhouses in agriculture (0.03%).

According to the size of the enterprises at the country level, about 64.59% of the investments of the enterprises included in the survey were made by micro-enterprises (1-9 employees) and small enterprises (10-49 employees). Medium enterprises (50-249 employees) and large enterprises (250 +) participate with about 35.41% of total investments.

Whereas, as far as the source of investments is about: 61.99% of the value of the enterprises' investments was realized from their own funds; 30.42% from local banks, while other sources occupy a smaller share in the framework of total investment resources.

Table 4. Direct investments in Kosovo - according to economic activity(in millions of euros)

Descr iption	Total	Agriculture, forestry and fishing	Mines and quarries	Productio n	Electricity supply , steam gas and air condit ioning supply	Constr uction	Whol esale and retail trade, repair of moto r vehic les, moto rcycl es	Trans port and storag e	Infor matio n and comm unicati on	Finan cial and insur ance activi ties	Real estate activiti es	Professi onal, scientific and technica l activitie s	Othe rs
2008	369.9	8.5	17.4	53.7	16.7	13.5	10.1	...	28.3	109.6	62.2	...	49.7
2009	287.4	13.1	7.0	57.6	8.7	35.5	16.2	-2.1	24.9	75.3	43.9	...	7.5
2010	368.5	0.9	17.7	101.1	...	54.2	6.8	7.5	-16.0	39.4	75.5	3.7	77.9
2011	384.4	0.6	-5.2	46.9	0.2	133.1	11.6	41.1	-9.0	33.0	60.5	10.7	60.9

2012	229.1	-0.7	-24.5	33.8	0.7	30.4	14.2	37.5	-3.3	23.0	95.1	5.1	17.7
2013	280.2	0.4	-14.1	13.8	63.0	15.3	14.5	0.8	2.5	23.0	121.2	4.4	54.2
2014	151.2	0.2	4.1	-35.1	5.9	-19.9	8.3	0.7	0.5	41.9	118.2	3.0	23.4
2015	308.8	0.9	36.9	20.0	12.9	43.1	12.6	0.4	2.4	64.4	153.3	4.7	31.1
2016	220.0	1.3	-19.4	4.2	-0.4	28.1	14.0	0.9	-4.2	19.0	139.7	5.8	31.0
2017	255.4	-1.3	-4.9	6.1	-0.8	5.1	9.0	-0.8	-3.8	55.2	154.7	5.7	31.1
2018	272.1	0.1	-2.7	-17.7	12.1	24.8	19.6	-0.2	-9.6	15.5	205.2	5.2	20.0
2019	254.6	1.5	-6.9	14.2	13.5	-17.1	-6.7	-6.2	2.3	13.9	223.8	3.4	18.9
2020	345.7	2.8	29.1	-4.6	30.0	11.4	-8.1	-16.0	1.6	85.1	201.1	3.6	9.6
2021	420.7	1.1	1.4	-0.4	-38.8	16.7	-4.0	4.3	17.3	24.6	384.0	5.7	8.55
2022 (Ja- Oct)	638.7	0.6	40.5	14.2	22.8	26.0	5.0	1.2	11.0	47.2	440.0	9.0	20.4

Other services: education, health and social work, social and personal services.ⁱⁱ

Foreign Direct Investment (FDI) until 2007 (before the declaration of Kosovo's Independence) was very high, but it decreases drastically in the years 2008 onwards. The growth of this decline in FDI is the result of many factors, some of the most important of which we are listing:

Political instability;

Inadequate international integration;

High corruption;

Non-literal rule of law;

Heavy energy condition, etc.

If we compare the rate of employment with the level of Investments, we notice that the increase in the level of Foreign Direct Investments does not mean the reduction of unemployment, and in order to achieve the reduction of unemployment, the FDI focus must be on the production sectors. In foreign investments, special emphasis should be placed on Investments from the Albanian Diaspora of Kosovo, which with their investments in the country of origin, unemployment would decrease, export production would increase and the well-being of citizens would decrease, emigration would decrease the number our citizens, but their material goods would also increase.

Except production, a very good opportunity for investment from the Kosovar Diaspora is also investment in tourism, since Kosovo has many attractive and very interesting tourist resources.

Meanwhile in many developed countries of Europe, the Linear Economy ("take, produce, throw") is intended to be replaced by the Circular Economy ("Take, produce, recycle"), in the Republic of Kosovo there is still no waste management strategy. In the National Strategy (2019-2023) there is no mention of the Circular Economy at all, which hints that this economy is little known in Kosovo.

Foreign investors, especially those of the Kosovar Diaspora who are successful in the countries where they live and operate, can invest in Solar Projects for solar energy and heating, thus helping the country's Economy. The Republic of Kosovo uses coal as the main source to produce electricity and during the winter season, in addition to constant reductions in electricity, the air quality is also not good, due to the outdated Thermal Power Plants.

2. CONCLUSION

As we can see from the data are given above, a large number of Kosovo Albanian citizens are in the diaspora and there continues to be great interest in emigration to Western countries for various reasons, one of the reasons being unemployment. In order to reduce the unemployment rate, which also means reducing emigration, real strategies must be created by governmental and non-governmental institutions and there should be continuous harmonization with the networks of Kosovo Albanian businesses living in the diaspora, so that have Direct Investments in Kosovo. The investments of our compatriots, in addition to helping in the economic development of Kosovo, at the same time would also affect the preservation of their connection with the country of origin.

In order to increase foreign investments, especially the investments of emigrants from Kosovo, we recommend some steps that should be taken seriously by the decision-making institutions of the Republic of Kosovo:

Guaranteeing foreign investments by the state of Kosovo.

Efficiency of the judiciary.

State agreements removal of double taxation.

Deduction the cost of electricity for investors.

Increasing the quality of education and training, which means increasing the qualified workforce.

Approval of the Law on wages and the Law on Social and Health Insurance.

Increasing the quality of health services.

Creating the National Strategy for Waste Management.

Learning about the Circular Economy in schools and universities, to realize television documentaries, including advertising spots on television, to prepare the new generations but also the labor force in Kosovo for the Circular Economy.

Frequencies

Statistics

Banks

N	Valid	10940
	Missing	775
Mean		131.0765
Std. Error of Mean		.21497
Median		123.1000
Mode		141.30
Std. Deviation		22.48521
Variance		505.585
Skewness		.610
Std. Error of Skewness		.023
Kurtosis		.043
Std. Error of Kurtosis		.047
Range		86.20
Minimum		92.60
Maximum		178.80
Sum		1434003.40

NPar Tests

Descriptive Statistics

	N	Percentiles		
		25th	50th (Median)	75th
Bankat	2048	116.3000	126.3000	141.3000

Chi-Square Test

Frequencies

Banks

	Observed N	Expected N	Residual

92.60	93	136.5	-43.5
93.90	94	136.5	-42.5
115.20	115	136.5	-21.5
115.40	115	136.5	-21.5
116.30	116	136.5	-20.5
120.40	120	136.5	-16.5

Test Statistics

	Banks
Chi-Square	216.692 ^a
df	14
Asymp. Sig.	.000

Amount

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 357.00	1	5.6	5.6	5.6
418.00	1	5.6	5.6	11.1
467.20	1	5.6	5.6	16.7
492.50	1	5.6	5.6	22.2
516.40	1	5.6	5.6	27.8
573.40	1	5.6	5.6	33.3
584.30	1	5.6	5.6	38.9
585.70	1	5.6	5.6	44.4
588.50	1	5.6	5.6	50.0
608.70	1	5.6	5.6	55.6
622.30	1	5.6	5.6	61.1
665.50	1	5.6	5.6	66.7
691.00	1	5.6	5.6	72.2
759.20	1	5.6	5.6	77.8
800.60	1	5.6	5.6	83.3
851.50	1	5.6	5.6	88.9
980.00	1	5.6	5.6	94.4
1153.40	1	5.6	5.6	100.0
Total	18	100.0	100.0	

Amount

N	Valid	18
	Missing	0

Frequencies**Statistics****Amount**

N	Valid	18
	Missing	0
Mean		650.8444
Std. Error of Mean		46.99273
Median		598.6000
Mode		357.00 ^a
Std. Deviation		199.37329
Variance		39749.708
Skewness		1.030
Std. Error of Skewness		.536
Kurtosis		1.182
Std. Error of Kurtosis		1.038
Range		796.40
Minimum		357.00
Maximum		1153.40
Sum		11715.20

NPar Tests**Amount**

	Observed	Expected	
	N	N	Residual

357.00	357	650.9	-293.9
418.00	418	650.9	-232.9
467.20	467	650.9	-183.9
492.50	493	650.9	-157.9
516.40	516	650.9	-134.9
573.40	573	650.9	-77.9
584.30	584	650.9	-66.9
585.70	586	650.9	-64.9
588.50	589	650.9	-61.9
608.70	609	650.9	-41.9
622.30	622	650.9	-28.9
665.50	666	650.9	15.1
691.00	691	650.9	40.1
759.20	759	650.9	108.1
800.60	801	650.9	150.1
851.50	852	650.9	201.1
980.00	980	650.9	329.1
1153.40	1153	650.9	502.1
Total	11716		

Test Statistics

	Amount
Chi-Square	1038.045 ^a
df	17
Asymp. Sig.	.000

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BQK

<https://www.youtube.com/watch?v=U8ZGSgvu9bQ>

BQK

Determinants of Green Innovation: Firm-level evidence from Albania

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Abstract

Green innovation, a new stream of innovation, includes all environment friendly new and original, innovative activities in which enterprises make use of advanced technology to achieve economic growth while giving consideration to environmental protection (OECD, 2009). This type of innovation may take the form of product, process, service, management or marketing systems. Theoretical and empirical literature review highlights factors such as the availability of technological resources, company-specific factors, firm organization, government policies, financial support, competitive conditions or consumer demand as main determinants of green innovations. Analysis of firm-level data from Flash Eurobarometer 498 (2021) Survey Data for Albania confirms that resource efficiency and climate neutral behavior are influenced by firm size, production costs, green investments amount, type of action taken by firms, export experience and other variables. The findings are relevant for firm's owners and managers and policymakers in order to improve strategies for enhancing the competitiveness through green innovations.

Keywords: green innovation, determinants, Albania, firms, barriers

Jel Code: O31, Q52, O39

Introduction

Despite the efforts of developed and developing countries to pursue sustainable development, problems still arise in terms of achieving the desired results. The main challenges are mainly related to inefficient governance and institutions in the formulation and implementation of effective strategies and policies, limited pool of qualified work-force, insufficient resources allocated to research and development as well as to the lack of investment by businesses in environmentally friendly technology.

The latter creates numerous macroeconomic benefits in terms of generating new jobs, increasing manufactured output, creating new markets and expanding trade, economic diversification and increasing national GDP (Weick, 2016). The Green Economy is related to the modification, reorganization and transformation of production processes in order to reduce

environmental pollution and use scarce resources more efficiently (Loiseau *et al.*, 2016). The green economy enables addressing the challenge related to the growing world demand for energy and the consequences of climate change (*ibid*). Green innovation includes all environment friendly improved or new and original products or processes which help minimize waste, save water, energy and other scarce resources, reduce the pollution and the risks of adverse natural phenomenon (Arundel & Kemp, 2009).

The main focus of this study is the analysis of the determinants and barriers of green innovations in Albanian firms. The study will be guided by a positivist approach as it is based on existing knowledge and theories as well as adopting a clear quantitative framework to investigate the phenomenon. Based on secondary data from Flash Eurobarometer 498 (2021) Survey Data, this study describes and analyses the variables on green innovations in Albania. The methodology is mainly quantitative since the variables on green innovation based on Flash Eurobarometer 498 (2021) Survey Data are quantitative in nature, but the review of the literature, the analysis of the findings of the existing studies are based on qualitative analysis.

The study is organized in three main sections. The first part presents a review of the theoretical and empirical literature related to the definition and types of green innovations, determining factors, barriers and impacts of green innovations. In the following session the paper deals with the current situation of green innovations in Albania. In the last session, the conclusions are presented.

Literature Review on Green Innovations

Many environmental problems related to global warming, natural disasters, increasing demand for energy and resources, and amongst others the increasing price of oil and food, have become global priorities. Approaching these problems and finding both short-term and long-term solutions has attracted the attention of all actors at the national, regional and global level. Regardless of the numerous international commitments, the situation is quite complex, and decisions and actions are required to minimize the negative environmental, economic and social effects. One of the main economic agents that is directly involved in this situation, are firms, regardless of their size or sector they operate. Faced with rising prices for raw materials and energy, businesses are continuously undertaking many technological innovations, with many of them not having a friendly approach to the environment.

Green innovations, green economy and circular economy are increasingly attracting the attention of policymakers and researchers, and are considered the main ways to deal with the current environmental situation. Different researchers have tried to define green innovations, which are also treated as eco-innovations or sustainable innovations. More precisely, green innovations are defined as innovations related to the introduction of new products or services, organizational or managerial processes of the firm with the aim to reduce negative impacts on the environment (Fussler & James, 1996). Green innovations can also be related to the technologies used in the production of goods or the provision of services that enable the reduction of environmental pollution (Kemp & Pearson, 2007). Green innovations are also defined as innovations related to green products or processes through the use of technologies that enable the most efficient use of resources, improve environment through the reduction of

pollution (OECD, 2009) or environmental sustainability (Oltra & Saint Jean, 2009). In a similar vein, Chen *et al.* (2006) argue that green innovations are related to the improvement of products and processes, the introduction of new technologies or the adaptation of existing technologies in order to preserve existing resources, reduce, recycle and reuse waste and manage firms in accordance with environmental responsibility.

A complex set of supply-side factors such as the availability of technological resources, company-specific factors, firm organization, government policies, financial support, competitive conditions or consumer demand are considered the main determinants of green innovation (Diaz-Garcia *et al.*, 2015; OECD, 2013; Arundel & Kemp, 2009). Regarding the driving factors of green innovations, the literature highlights numerous endogenous or exogenous factors that push companies towards new technologies, improvement of existing products or the introduction of new products as well as managerial or marketing innovations. These factors are mainly related to access to finance and opportunities for new green investments not only relying on internal sources, but also on external sources such as public support with subsidies or grants or soft loans from the banking system. An important determining factor is also the knowledge, skills and human capacities that companies have, the positive approach to changes and the social and environmental responsibility of enterprises. Internal endogenous determinants are also related to the short-term and long-term objectives and strategies of the firms and their positive perception regarding the economic benefits derived from innovations and green technologies as well the circular economy. Also, such factors can be related to firms' intentions to reduce production costs in order to increase competitiveness (Diaz-Garcia *et al.*, 2015), efforts to save resources such as water, energy, materials and raw materials (Clark & Charter, 2007), the expansion of the existing market and access to new markets of green products or services (OECD, 2013) as well as the environmental responsibility of the firm (Bansal & Roth, 2000). Regardless of many incentives to green innovations, there are big differences between firms depending on their size, the way of organization, the sector where they operate, the markets where they sell, resulting in many firms that are not involved in green technological investments, in the undertaking of friendly actions with the environment or in the provision of green products or services. Existing differences in the behavior and approach of firms are largely related to inhibiting factors or barriers to green innovations. Factors that negatively affect the tendency and propensity of firms for green technology and innovations can be internal or external. Based on the existing literature, endogenous factors can be related to the technological absorptive capacities of firms that are affected by the lack of environmental knowledge and the availability of resources (Walker *et al.*, 2008), managerial obstacles and the lack of qualified human resources (Arundel & Kemp, 2009), lack of human and financial capacities for research & development, increased production costs due to green investments and the uncertainty of their returns (Marin *et al.*, 2015). External barriers are mainly related to suppliers, customers or the government. Different firms may face obstacles that are the result of the lack or insufficiency of market demand for green products or services (Arundel & Kemp, 2009), technology available in specific markets (Chang & Slaubaugh, 2017), lack of adequate financial resources (Reid & Miedzinski, 2008; Pinget *et al.*, 2015), unavailability of bank loans and lack of subsidies and financial incentives (Cecere *et al.*, 2018), problems with information on environmental issues, complex legislation and regulations, lack of guidelines, lower institutional support, lack of consultancy to monitor the progress (Patil & Kant, 2014), lack of awareness on green products and services importance

(Chen *et al.*, 2006). In terms of firm size, most Micro, Small and Medium Enterprises (MSMEs) have limited skills and resources to invest and adopt a new opportunity, which makes them struggle with the challenges on how to prioritize resources to adopt a sustainable and environmentally friendly model, and how to access information to participate in the green growth trend. MSMEs are facing new challenges from industry transformation and natural resource constraints.

Given the increased competition, rapid changes in technology, and increased consumer power and choice, success belongs to companies that are able to identify and understand consumer expectations and desired values and respond to them effectively (Wang & Liao, 2007). Market-oriented firms are more likely to secure long-term profits by providing superior value to customers, as a result of identifying their current and expected needs, recognizing the strengths and plans of competitors, coordinate and appropriate actions in terms of time, as well as the introduction of new products in order to influence the market environment (Slater & Narver, 2000).

The benefits from green innovations based on the theoretical and empirical literature can be classified into microeconomic and macroeconomic. The former can be analyzed at the firm level and are related to reduced costs due to efficient production driven by new green technologies, or saving energy and resources (Gürlek & Tuna, 2018), improvements in the work environment or ethical behavior of employees (Hillary, 2004), increase in the total revenue of the firm as a result of product differentiation, increase in the number of customers, market expansion and comparative advantages (Parry, 2012; García-Sánchez *et al.*, 2019). Firm benefits are also related to increased labor productivity (Woo *et al.*, 2014) as well as to a positive corporate image. On the other hand, the macroeconomic benefits of green innovations are related to the expansion of employment and the opening of green jobs, the reduction of unemployment and poverty, the increase of the gross domestic product, environmental benefits and sustainable development due to changes in social norms and values and institutional structures (OECD, 2009).

Green Innovations in Albania

During the last three decades, Albania has experienced positive developments in terms of increasing the domestic product and per capita income, reducing poverty, developing infrastructure, expanding trade, tourism, renewable energy sources, increasing urbanization, improving living conditions and doing business. Regardless of these positive trends, the current situation in terms of sustainable development presents current and long-term challenges. The uncontrolled movements of the population within the country and the lack of legislation or weak institutions resulted in an unprecedented increase in illegal constructions, indiscriminate exploitation and mismanagement of natural resources. During the last decade, the use of water resources for the production of electricity has grown rapidly in Albania, a situation that negatively affects natural ecosystems and especially those with high sensitivity, such as protected areas, national parks, tourist areas and tourist villages, which contain a large number of species of flora and fauna. Major part of the natural resources in Albania are threatened by overfishing, uncontrolled tourism, fires, environmental pollution, lack of treatment of waste and used water, uncontrolled management of the territory. Erosion, soil taking, mismanagement, inappropriate agricultural practices, deforestation have resulted in the degradation of agricultural land which in turn has negative economic effects in terms of reducing soil fertility, lower agricultural output in the short-term, or long-term negative environmental impact in terms of sediment deposition, water eutrophication, reduction and physical loss of the agricultural land. The annual cost of agricultural land erosion is at least US\$ 60 million or US\$ 86 per ha (Lekaj *et al.*, 2016), therefore the sustainable management of natural resources and more specifically of land and soil is an essential element for improving life, the preservation of ecosystems and to ensure the best possible protection from natural phenomena such as erosion and flooding.

The private sector and especially MSMEs have great economic and social importance, thus being considered important pillars of the Albanian economy. MSMEs are important in absolute and relative terms regarding the number of active firms in the country and represent 99.8% of the total (INSTAT, 2022). In addition, according to the same source (INSTAT, 2022), also presented in Table 1, such firms are also important in terms of employment of the workforce in the private non-agricultural sector, in terms of investments and value-added, contributing respectively with 81.9% of total employees, 74% of realized private investments and 74.1% of the added value in the economy. Regardless of the great role, MSMEs face a series of problems and challenges such as limited access to finance, the low level of participation in the global value chain expressed through their share in exports and imports which amounts respectively to 2.6% and 10.1%, lack of qualified workforce, decrease in total turnover and bankruptcies, numerous financial risks also due to the increase in the prices of resources, especially energy and transport, unfair competition.

Table 1: Main indicators of firm performance by firm size

Indicators	Micro	Small	Medium	MSME	Large
Number of total firms (%)	93,2	5,5	1,1	99,8	0,2
Total number of employed (%)	37	22,1	22,8	81,9	18,1
Turnover (%)	22,4	31,4	25,9	79,7	20,3
Total investments (%)	13,3	32,2	28,4	74	26
Value added (%)	22,2	25,9	26	74,1	25,9
Exporting firms (%)	1,2	18,1	38,5	2,6	47,9
Importing firms (%)	7,4	45,1	66,2	10,1	82,8

Source: INSTAT (2022)

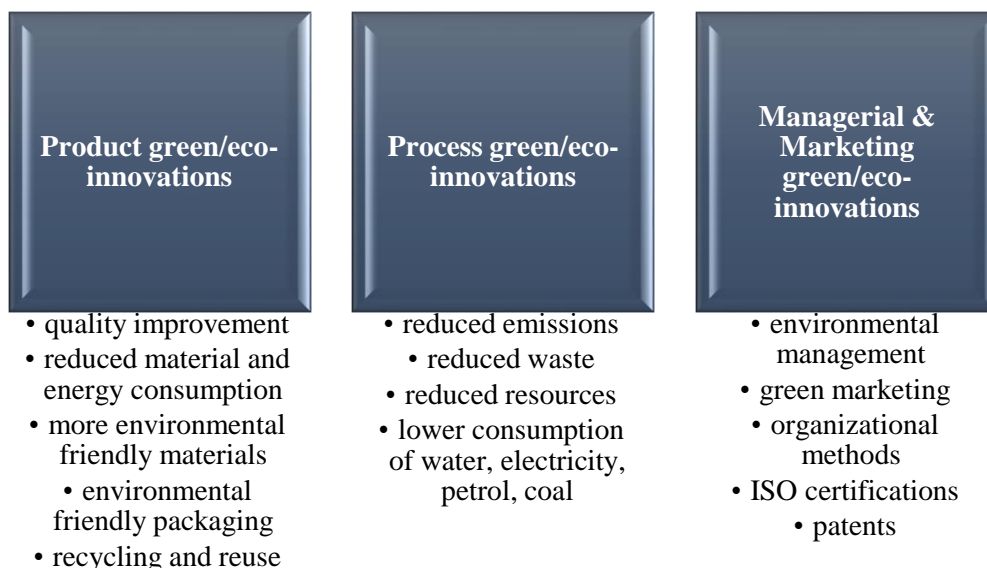
Under the conditions of major environmental challenges and the necessity of achieving the objectives of sustainable development, the Albanian government has tried and continues to improve the legislation with laws and regulations, but their implementation continues to remain slow. The Green Agenda for the Western Balkans compiled in accordance with the European Green Deal will serve as an impetus for improving the legislation on environmental protection, but also for promoting actions and taking measures for the implementation and monitoring of the implementation of environmental laws and standards. The agenda is designed with the vision of sustainable development in the framework of an inclusive green economy, which enables the preservation of ecosystems, reduction of pollution, sustainable agriculture to meet current and future social and economic objectives. The strategic framework proposes a common vision and three objectives (EC, 2020):

1. Reduction of environmental risks and ecological shortages.
2. Improving economic progress.
3. Improving human well-being and social equality.

Albania has made limited progress in promoting MSME innovation and improvements are related to improving the innovation framework and government institutional support services for innovative SMEs (OECD, 2022). Albania's Business and Investment Development Strategy (2021-2027) places an emphasis on SME innovation and links between industry and academia to drive economic growth. Coordination of the innovation policy framework continues to be a major obstacle to effective implementation, while financial support for innovation remains limited. Incentives from the government for private actors and resources for monitoring and fulfilling environmental standards are missing. Green practices in Albanian firms are limited by the lack of mandatory legislation, lack of environmental knowledge and lack of awareness in managerial practices. The majority of Albanian businesses are not inclined towards innovations and green technologies due to the lack of organizational and managerial resources, the high costs of implementing environmentally friendly strategies, the lack of

interest from consumers as well as the lack of information regarding the economic benefits derived from green investments (Shyle, 2018). Green innovations may take the form of product, process, service, management or marketing systems.

Figure 1: Forms of Green Innovations (OECD/Eurostat (2018))



Source: Based on literature review

Greening MSMEs can help reduce carbon emissions, reduce environmental degradation, improve energy and resource efficiency, and increase food security. In turn, this process can increase the competitiveness of MSMEs by allowing them to use modern technologies to develop green business models that increase their capacity to engage in global value chains (GVC), as well as by improving their access to market, especially when faced with emerging international environmental standards. Based on Flash Eurobarometer 498 (2021) micro-level data results that Albanian firms taken action to become resource efficient are related to saving water 8%, saving energy 23%, using predominantly renewable energy (e.g. including own production through solar panels, etc.) 4%, saving materials 8%, switching to greener suppliers of materials 6%, minimizing waste 10%, selling own residues and waste to another company 12%, recycling, by reusing material or waste within the company 18%, designing products that are easier to maintain, repair or reuse 9%, other 3%. Green innovations in Albania are directed mainly toward product and process improvement.

Table 2: Resource efficiency action taken by firm size, sector and establishment

Indicator	Marginal Percentage	
Resource efficiency action	no action	34,6%
	at least one action taken	65,4%
	Manufacturing	13,1%
	Retail	28,0%

Sector of Activity	Services	34,6%
	Industry	24,3%
Firm size	1 to 9 employees	43,0%
	10 to 49 employees	30,8%
	50 to 249 employees	16,8%
	250 or more employees	8,4%
	Don't know/No Answer	,9%
Firm establishment period	Before 1 January 2014	80,4%
	Between 1 January 2014 and 31 December 2016	9,3%
	Between 1 January 2017 and 1 January 2021	9,3%
	After 1 January 2021	,9%

Source: Flash Eurobarometer 498 (2021), authors' calculations.

From the data, it appears that 65.4% of Albanian companies have taken at least one action related to the efficiency of resources during the last two years. If the data is analyzed, it turns out that companies operating in the service and retail sector have a greater tendency to take environmentally friendly actions compared to companies operating in the industry and manufacturing sector. Based on the data, it is concluded that micro and small firms are more prone to these actions than medium and large firms. Firms that have a relatively longer period in the market are more prone to changes and to undertake actions that result in greater resource efficiency.

The actions of Albanian firms to become climate neutral are less widespread than the actions that are oriented towards resource efficiency with only 21.5% of the total number of firms that have undertaken such actions in the last two years and that now have strategies in order to reduce their footprint on the environment. The actions taken by the companies to be climate neutral consist in reduction of carbon emission 21%, adoption or purchase of new technological solutions to reduce emissions 62%, development of new technological solutions to reduce emissions 27% or offset carbon emissions by purchasing carbon credits or funding equivalent carbon saving elsewhere 10%.

Based on the results of the correlation coefficients from the non-parametric tests, it is concluded that there is a statistically significant positive relationship between the size of the company in terms of the number of employees and its tendency to take at least one action for resource efficiency (Spearman's rank correlation $r(105) = [.325^{**}]$, $p = [.001]$, Kendall rank correlation coefficient $\tau_b = .302^{**}$, $p = .001$), between full time employees working in green jobs and firm's tendency to undertake at least one action for resource efficiency (Spearman's rank correlation $r(105) = [.212^*]$, $p = [.028]$, Kendall rank correlation coefficient $\tau_b = .204^*$, $p = .029$). Based on the results of correlation coefficients from non-parametric tests, it is concluded that there is

a statistically significant negative relationship between changes in production costs and firm's tendency to take at least one action for resource efficiency (Spearman's rank correlation $r(105) = [-,783^{**}]$, $p = [,000]$, Kendall rank correlation coefficient $\tau_b = -,717^{**}$, $p = ,000$), between investments as a percentage of annual turnover for resource efficiency actions and the tendency to take at least one action for resource efficiency (Spearman's rank correlation $r(105) = [-,837^{**}]$, $p = [,000]$, Kendall rank correlation coefficient $\tau_b = -,790^{**}$, $p = ,000$).

Despite these characteristics, SMEs face challenges in terms of environmental standards. SMEs tend to act only when pressure is exerted on them from outside, unlike large companies that tend to be more proactive, that is, to respect environmental standards. Regarding the implementation of environmental standards, SMEs face various obstacles: internal obstacles include limited resources and time, being unaware of the negative effects on the environment, while external obstacles include the lack of public infrastructure, insufficient support by institutions and complex regulatory requirements.

Table 3. Barriers of Albanian firms to green transition

Difficulties	Micro	Sma	Medium	SMEs
		II		
Complexity of administrative or legal procedures	12%	22%	24%	13%
Difficulty to adapt environmental legislation to your company	6%	20%	18%	7%
Technical requirements of the legislation not being up to date	0%	28%	29%	2%
Difficulty in choosing the right resource efficiency actions for your company	12%	14%	18%	12%
Cost of environmental actions	15%	28%	29%	16%
Lack of specific environmental expertise	21%	14%	41%	21%
Lack of supply of required materials, parts, products or services	27%	29%	24%	27%
Lack of demand for resource efficient products or services	7%	28%	29%	9%
Other	9%	0%	0%	8%

Source: Flash Eurobarometer (2021), authors' calculations.

Greening MSMEs also contributes to job creation in green industries and creates a resilient economy that provides a better quality of life for all people. Compared to large companies, SMEs have an advantage in presenting pro-environmental products and services, due to the

characteristics and features they possess. Flexibility is one of them. SMEs have the ability to quickly adapt to market changes. Thanks to this ability, SMEs are able to develop various products and practices, which of course include green ones.

Table 4. Measures and support needed to help Albanian firms to green transition

Support needed for green products or services	Micro	Small	Medium	MSME
Financial incentives for developing products, services or new production processes	57%	23%	75%	55%
Assistance with identifying potential markets or customers	14%	58%	50%	17%
Technical support and consultancy for the development of products, services and production processes	28%	20%	25%	27%
Consultancy services for marketing or distribution	0%	57%	25%	4%
Other	0%	20%	0%	1%
Support needed to be more resource efficient	Micro	Small	Medium	MSME
A tool to self-assess how resource efficient your company is with respect to other companies	6%	11%	11%	6%
Consultancy on how to improve resource efficiency in your company	22%	12%	17%	21%
Grants or subsidies	17%	32%	22%	18%
Advice on funding possibilities and financial planning for resource efficiency investments	18%	11%	44%	19%
Demonstration of new technologies or processes to improve resource efficiency	12%	17%	22%	12%
Database with case studies that show the benefits of resource efficiency for companies	3%	22%	17%	4%
Better cooperation between companies across sectors so that new processes to re-use waste and by-products can be develop	22%	17%	22%	22%
Clearer rules on the use of secondary raw materials	7%	11%	17%	7%
Other	4%	6%	0%	4%

Source: Based on data from Flash Eurobarometer (2021)

Clients behaviour and market demand as well potential export markets such as the European Union are an important driver of sustainability activities for Albanian firms (Icka *et al.*, 2021).

Based on the results of the correlation coefficients from the non-parametric tests, it is concluded that there is a statistically significant positive relationship between the supports that firm takes and its tendency to offer green products or services (Spearman's rank correlation $r(105) = [.763^{**}]$, $p = [.000]$, Kendall rank correlation coefficient $\tau_b = .741^{**}$, $p = .000$), between market where firm operate and firm's tendency to offer green products or services (Spearman's rank correlation $r(105) = [.914^{**}]$, $p = [.000]$, Kendall rank correlation coefficient $\tau_b = .882^{**}$, $p = .000$).

Their relatively informal style of communication, as well as their flatter hierarchy compared to large companies, enables new approaches to green business practices. In addition, the footprint that SMEs leave on the environment is more important, despite the fact that they have less impact on the environment compared to large companies. These particularities help SMEs in developing green products and practices, but also provide them with a competitive advantage.

Environmental policies aimed at SMEs are included in Albania's newest strategy for SMEs, the Business and Investment Development Strategy (2021-2027) and aims to promote the circular economy and eco-innovation. Limited progress has been made in implementing the greening measures included in the previous Business and Investment Development Strategy (2014-2020), partly due to poor coordination between relevant institutions and limited allocated funds. Nowadays the incentives and instruments to encourage SMEs to engage in greener practices are still scarce. Access to green finance is also limited, while regulatory instruments are non-existent. In general, the measures for the greening of SMEs planned in the SME strategy have not been translated into concrete actions. Awareness activities regarding the benefits of greening activities among SMEs, such as cost savings and increased productivity, have been carried out through various campaigns with the support of international partners.

The main findings of the study enable the proper addressing of current problems as well as the identification of the most appropriate public policy instruments to promote environmental innovations and green innovations in Albanian businesses, with the main focus on micro, small and medium enterprises. While efforts to support green innovations have been limited, green innovations should be promoted and supported as part of the new SME strategy (through capacity building, business-to-business partnerships and increased access to finance).

Conclusions

The literature review highlights the driving factors of green innovations, both endogenous and exogenous factors that push companies towards new technologies, improvement of existing products or the introduction of new products as well as managerial or marketing innovations. Factors that negatively affect the propensity of firms for green technology and innovations can be internal or external. On other side, the benefits from green innovations based on the theoretical and empirical literature can be classified into microeconomic and macroeconomic such as production costs reduction, saving of resources and energy, comparative advantage, diversified production, new jobs, better living conditions.

While many developed countries are progressively adopting to green innovation, Albania has made limited progress in promoting SME green innovation. Results from the descriptive analyses for Albania shows that coordination of the innovation policy framework continues to be a major obstacle to effective implementation, with the financial support being quite limited. Incentives from the government for private actors and resources for monitoring and fulfilling environmental standards are missing. In addition, green practices in Albanian firms are limited by the lack of mandatory legislation, lack of environmental knowledge and lack of awareness in managerial practices.

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Export plan and marketing entry strategy for "Jus de Mer"

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Abstract

International expansion is no easy feat. A company must consider a multitude of factors when determining the right strategy to enter a new market. This includes both internal factors, such as facts regarding the product and company, but also external factors, like the export country's market characteristics. To initiate our analysis of the Dutch beer market, I started off by researching the Netherlands' sociocultural, legal, economic, political, and technological environment. Following this, direct, indirect, and potential competitors were analyzed to evaluate their strengths, weaknesses, and how these may pose threats or opportunities for Jus De Mer's market entrance.

These analyses were used as a base for our suggested marketing mix and market entry strategy, which are combined to form an export plan.

Regarding the product policy, Jus de Mer should opt for standardization. This ensures consistent quality, operations can be carried out more quickly, bottlenecks are recognized, and costs are reduced, leaving more budget for other activities. Within their promotional efforts, Jus De Mer must maintain a consistent brand image across countries while adapting effectively to a country's culture, norms, and values. For the Netherlands, this means having communication through advertising be direct and to the point, with campaigns emphasizing the Dutch's value of indulgence and living life to the fullest.

In this report, the findings from our previous research regarding the international marketing environment and competitor analysis have been documented and used as a base for the export plan, which contains the **International marketing mix** for the company Jus De Mer. The international marketing mix has been set up based on previous findings from the research, information provided by Jus de Mer on the first day, and additional required research conducted when prior research and knowledge was not sufficient. Both the distribution strategy and the market entry strategy have been conducted the same way. In the end, a conclusion was written to both finalize and summarize the findings in a clear manner.

With this export plan, the goal is to aim to present Jus De Mer with a structured, computed strategy to aid their process towards international expansion. The products that are focused on

within this export plan are Jus De Mer Blond and Double Eight, two specialty beers that may delve into the alcoholic beverage market of the Netherlands.

Keywords: export, expansion, strategy, standardization.

JEL codes: F23, F62, G34

Introduction.

Founded in 2014, Jus de Mer is the product from two enthusiastic beer brewers. A beer brewed so passionately, it nearly speaks for itself. That is the ideology of the two brewers: 'go with the flow'. Based in the coastal town of Middelkerke in Belgium, Jus De Mer was quick to become a local treasure, as their ideology of living life to the fullest and enjoying every moment appealed greatly to the town's population. Jus De Mer positions themselves as an authentic brewery that only uses the purest ingredients to create a flavorful and satisfying beer, meant to be devoured when celebrating the little joys of life. Now that Jus De Mer has earned its place in the heart of the citizens of Middelkerke, it is time for the next step. It would be unfortunate for such a passionate brewery to not direct this flow towards other markets, allowing them to discover this beer. That is the aim of this project; to explore the opportunities for Jus de Mer within their first steps towards international expansion. This report will be focused on the potential expansion of Jus De Mer to the country of the Netherlands. The Netherlands is a promising country. Neighboring to the home country of Belgium, the Netherlands not only shares a border, but also great and beneficial similarities in the beer drinking culture.

International expansion is no easy feat. A company must consider a multitude of factors when determining the right strategy to enter a new market. This includes both internal factors, such as facts regarding the product and company, but also external factors, like the export country's market characteristics. To initiate our analysis of the Dutch beer market, we started off by researching the Netherlands' sociocultural, legal, economic, political, and technological environment. Following this, direct, indirect, and potential competitors were analyzed to evaluate their strengths, weaknesses, and how these may pose threats or opportunities for Jus De Mer's market entrance.

For the pricing strategy, the differences between average prices of beer in Belgium and the Netherlands have been compared and it was found that Jus de Mer can safely ask €0,40 extra per beer to ensure enough coverage for transportation costs.

These analyses were used as a base for our suggested marketing mix and market entry strategy, which are combined to form an export plan.

Regarding the product policy, Jus de Mer should opt for standardization. This ensures consistent quality, operations can be carried out more quickly, bottlenecks are recognized, and costs are reduced, leaving more budget for other activities. Within their promotional efforts, Jus De Mer must maintain a consistent brand image across countries while adapting effectively to a country's culture, norms, and values. For the Netherlands, this means having communication

through advertising be direct and to the point, with campaigns emphasizing the Dutch's value of indulgence and living life to the fullest.

Summarized conclusions SLEPT

Despite being neighboring countries and having a shared language, the social cultural environment of the Netherlands still has some areas that drastically differ from that of Belgium. The extremely low-context culture of the Dutch is one that would have to be adapted to when launching different marketing efforts, as Jus De Mer should focus on being straight-forward and explicit within their advertising in order to appeal to their desired audience. Hofstede's dimensions have also proven that the cultures have both similar and diverse views and values, but the Dutch's high score within the indulgence dimension is a very positive factor for the beer company. The unique Dutch beer culture also opens many opportunities for Jus De Mer to enter the marketplace, as there are numerous occasions that include heavy beer drinking, and a wide array of pairing options they could experiment with. Evolving trends within the beer industry, such as an increased interest in non-alcoholic and specialty beers, create lots of opportunity for Just De Mer, giving them a chance to try new things and potentially even expand their product line in foreign markets.

We can conclude that when Jus de Mer wants to export their product to the Netherlands the laws and regulations are very similar to those of Belgium. This is because most of the laws are drawn up on a European level and both countries are members of this. Jus de Mer must therefore already comply with the rules in Belgium that also apply in the Netherlands. We do notice one difference that Jus de Mer has to take into account, namely excise duty. It is possible that these are paid in the country of production or the country they are exporting to, but this depends on whether Jus de Mer has or hasn't a license to deliver suspended.

The Dutch economy is showing signs of recovering from the pandemic and also the current beer market in the Netherlands shows good potential for Jus de Mer, as the market has been increasing a lot during recent years and is expected to reach new records until 2025. Consumption figures are also on the right side for Jus de Mer, because despite the upward and downward of beer consumption in the neighboring country, those figures still stay high. Export and Import's not strict duties and taxes, but also the emerging of trends such as the attention to craft brews, favor as well the opportunity for Jus de Mer to grow in the Netherlands.

The government can exert a great influence on exports and imports. The more stable a government is, the less risk there is. The Netherlands has a very stable; the cabinet of Mark Rutte has ruled the Netherlands for almost 12 years. This is good news for Jus de Mer, because there are no risks such as the collapse of a government, extreme trade conditions, etc. Belgium has a very unstable government, but this will not immediately have a major impact on Jus de Mer's export plan. Since Belgium and the Netherlands are members of the European Union, there are general rules concerning the import and export of goods within Europe. These can only be changed by the European government. Jus de Mer can export its goods to the Netherlands without any problems.

With a slight edge over Belgium, the Netherlands is more advanced in technology and its innovation. Fortunately, this has a negligible impact on the technology within the brewing industry. Export wise, technology adds little value to the neighboring country, making that no barrier either. An increase in mobile usage does put extra value on digital marketing, making this the only barrier that stands in the way of Jus de Mer when going to the Netherlands.

Summarized conclusions competitors' analysis

In 2019, Zeeland, the coastal region of the Netherlands, counted 16 breweries, half of which had their own brewery installation (Sohier, 2019). This means there will be lots of direct competition for Jus De Mer, as the majority of these breweries have similar positions within the market, meaning they often share a target audience as well. Zeeland's biggest brewery, which will undoubtedly be a competitor because of its dominance, is called BrouwerijKees. They are known for their vast variety of beers, with extremely unique flavors and canned packaging. Texels is another direct competitor for Jus De Mer in the Dutch market. Texels positioning is extremely similar to that of Jus De Mer. Their advertising and imagery is almost the same, making Texels a brand Jus De Mer would definitely have to watch out for. Jus De Mer should focus on their unique selling points, such as their wine glass and ocean-based approach.

Due to often being related as a refreshing drink, just like Jus de Mer blonde, both Corona and Desperados are seen as secondary competitors. These brands are some of the most popular refreshing drinks for the warmer summer days. Corona, currently owned by AB InBev, is a refreshing beer with a 4,5% volume percentage of alcohol. It encourages its drinker to live life at a slower and more relaxed pace. Desperados, currently a subsidiary of Heineken, is a party-focused beer brewed with tequila. Both beers have since introduced multiple new beer to their name such as alcohol-free beers and different flavors. Additionally, both beers are focused a lot on the refreshment of its beer. Comparing that to Jus de Mer, who focusses on the beer, it sets itself apart in a good way for the eyes of the customers who like to enjoy a beer to its fullest. Neither Corona nor Desperados are seen as clear favorites by the customer, giving Jus de Mer a good change to enter the market in comparison to these beers.

Non-alcoholic beer consumption has increased a lot during recent years and this increasing trend makes Braxzz an indirect competitor for Jus de Mer in the Dutch market. Braxzz products are non-alcoholic, and contain extremely little sugar and far less calories than alcoholic beers like Jus de Mer. In the short term, both breweries goal to position themselves as leaders of craft beers. The fact that Braxzz is already an international company and their tasting strategy of creating a taste of their beer that is similar to the regular alcoholic beers, are the the strengths of the company, and the lack of beer variety is what can be considered as their weakness. On the other hand, the growing trend and the increase of attention

towards craft beers and non-alcoholic beers are big opportunities for Jus de Mer to grow in the Netherlands, and their threats include the other competitors and their customer loyalty.

Coast and St. Idesbald are two brands that are direct competition for Jus de Mer in the home market but potential competitors in the Dutch market. Jus de Mer should keep in mind that in terms of social media and website it lags behind the two competitors, and this could be to the disadvantage of Jus de Mer if St. Idesbald and Coast decide to export. Jus de Mer should not be inferior to these two other beer brands but should improve in areas such as marketing and as mentioned earlier social media.

International marketing mix

Product strategy

A product strategy or product policy is the basis of successful products and services. This strategy is transparent, concrete, connects and strengthens the marketing mix. A successful product strategy is dynamic and adapts to the wishes of the customers, the changes in the market and the commercial success. The aim of the product strategy plan is to achieve your objectives and to be in line with the business strategy and vision. The product is the core of the marketing mix, as all other elements surround it. If you want to sell more of a certain product, it must meet the wishes and needs of the customer. You can distinguish yourself from the competition in this part.

A product consists of several product levels and each level adds a certain value for the customer. The three product levels are:

The core product: This is the basic function or benefits that a product provides for a customer. The primary function of both Jus de Mer Blond and Jus de Mer Double 8 is to quench thirst. In addition, the consumer wants to fulfil his need or desire for beer. Therefore, the beer should really taste like beer.

Tangible product: This is about the characteristics of the product such as quality, design, brand name or other properties. Jus de Mer Blond and Jus de Mer Double 8 are traditionally brewed with natural ingredients without addition of flavors, color or other additives. The recipe was experimented with for three years until Alexander and Bart were 100% satisfied with the result (Jus de Mer, sd) So, the quality of their beer is on point. Another feature is the packaging of the product. Their blond and brown beer are packaged in 33cl bottles or in 20 liter barrels. One of their USPs is that they do not use a typical beer glass to pour their beer. They use a wine glass. Jus de Mer is not widely known in Belgium at the moment, so the brand name will only have an added value for some.

Extended product: This is about the non-tangible benefits that give the product added value. These are mainly extras that make the product more attractive such as service, guarantee, delivery conditions, payment options, For Jus de Mer, it is not yet entirely clear what these are. As soon as they start exporting to the Netherlands, they will be able to offer extra services, draw up delivery conditions (e.g. delivery period of 5 working days) and so on. This is certainly something the company will have to think about.

Jus de Mer positions itself as a premium beer or specialty beer. They do not sell products as a primary necessity of life, as their products contain alcohol. Alcoholic beverages are rather considered a stimulant and when consumed in excess it is even a threat to health.

As mentioned before, Jus de Mer is not a beer like any other. The recipe took three years to develop and only natural ingredients are used in the brewing process. Jus de Mer is a special beer that is often drunk at the coast. A possible positioning statement of Jus de Mer could be:

For all coastal visitors or coastal residents who find joy in the simple things in life, Jus de Mer offers a refreshing terrace beer with a thirst-quenching character of fruity and slightly bitter notes. Beer in its purest form, brewed traditionally and containing solely natural, real ingredients. Perfectly compatible with the regional products of the coast, Jus De Mer is meant to be enjoyed with your feet in the sand and a sunset on the horizon. Served in a classy wine glass, Jus De Mer exudes quality and indulgence.

The positioning can remain the same in Belgium and the Netherlands as there are no major differences in the beer culture of both countries. This will also allow the brand to use standardization to maintain a consistent brand image, which is essential for successful internationalization.

To design a proper product strategy, Jus de Mer needs to know the specific tastes of the market and what type of product they prefer. RuigrokNetpanel conducted a quantitative beer survey in 2019 on the consumption and experience of beer among Dutch beer drinkers. This research asked, among other things, which types of beer consumers drank at least once a month. The results were as follows (See appendix 2):

Alcohol-free beer (0.0% to 0.5%): 47%.

Low alcohol beer (0.6% to 5%): 38%.

Pilsner (Around 5%): 73%

Special beer (5% or more): 46%

From these results, we can conclude that lager is drunk most by beer drinkers. It was also found that beer drinkers aged 18 to 29 drink low-alcohol beer relatively often, while senior citizens aged 65 and over drink specialty beer more often (RuigrokNetpanel, 2019). This is good news for Jus de Mer as they mainly focus on the older generation.

It was also investigated which taste profile(s) for beer were preferred. The results were as follows (See appendix 3):

Fresh and fruity (Refreshing light beers with spicy and fruity tones): 41%.

Supple and subtle (Accessible blonde beers with subtle flavor nuances): 34%.

Blonde and powerful (Robust blonde beers, bitter and effervescent in character): 32%.

Dark and rich (Firm, full and dark beers with notes of caramel and candy): 25%.

Amber and elegant (Dark blond and amber colored beers, creamy and slightly sweet): 21%.

Intense and challenging (Extreme taste sensations): 10%.

Two in five beer drinkers prefer fresh & fruity beer. Men more often prefer smooth and subtle (36%), blond and powerful (35%) and dark and rich (27%). Women, on the other hand, prefer fresh & fruity beer (54%) (RuigrokNetpanel, 2019).

Regarding the product policy, Jus de Mer should opt for standardization. They currently have a strong recipe and a strong concept that they should certainly not change. Standardization ensures consistent quality for both employees and customers or external parties. Because there is no need to think repeatedly how something should be done and which steps should be taken, actions can be carried out more quickly. Time and again, this saves time and money. Because it is clear how processes run, you quickly recognize the bottlenecks and see where improvements can be introduced quickly. The biggest advantage of standardization is that it reduces costs and creates more budget for marketing activities, among other things.

Promotion strategy

The 4 P's of the marketing mix must all be adapted in one way or another to successfully integrate a product into a new international marketing environment. Promotion becomes particularly important when positioning a product or service into a new market. Through proper promotion, a company can send the same message worldwide, by using relevant and engaging techniques specifically catered to its export countries. With the rapid growth of globalization, the line between a company's marketing within their home country compared to external markets is becoming increasingly blurry. This also means that differentiation is becoming more difficult in global markets, which is why it is important for companies to adapt their marketing mix based on local languages, needs, wants, and values in order to sustain competitiveness.

To successfully implement a promotion strategy within the Netherlands, Jus De Mer must first analyze a country's marketing environment based on a country's socio-cultural, legal, economic, political and technological factors (see *summarized conclusions SLEPT*). Then, they must observe how consumer responses are influenced by different internal and external factors. Internal factors include demographics, knowledge, attitudes, and beliefs while external influences include culture, ethnicity, family, lifestyle, etc.

Values are one of the most important factors to cater your promotional efforts to in order to form a connection with your target audience. A company's values are what allows them to create a unique positioning within a market. With the rapid growth of new brands entering the beer industry, having consistent, distinctive positioning is one of the only ways to gain a competitive advantage. Therefore, Jus De Mer's positioning must become so clear that people automatically associate the product with certain words, imagery, and ideologies.

Since Jus De Mer will be implementing a direct export entry strategy with the use of an agent. This is beneficial as the agent will already be familiar with the marketing environment and can use their expertise to aid the development of effective promotional strategies for Jus De Mer. The following is a suggestion of the type of campaign Jus De Mer could implement upon entering the Dutch market.

Price strategy

Pricing is undoubtedly an important factor of the marketing mix. It is one of the deciding factors in the eyes of the consumer. However, putting the price only in favor of the consumer could result in a price too low to make a profit. On the other end of the spectrum, a price that is then too high will probably put the product out of the consumer's mind. An adequate pricing strategy is a must for a company looking to enter a new market.

The average price of a lager beer in a coastline city in the Netherlands, is around €1,70 (pint price, 2010). Craft beers/specialty beers go for around €1,80 to €2,00 in supermarkets (Gall&Gall, 2022). When ordering from a terrace, the price of craft beers/specialty beers can go up to an average of €4,50 per individual order (Świątnicka, 2019). In Belgium, the average beer sells for €1,62 in a supermarket and €3,50 in a restaurant/terrace (Costs of living in Belgium, 2022).

Currently, Jus de Mer sells its beers to supermarkets and bars/hotels/pubs in Belgium for €1 per beer. When entering the Dutch market, it cannot just keep its selling prices the same as for Belgium. Different reasons could be given for this; arguably the most obvious reason is the transportation of the beer. Currently, the beer is being brewed in their own brewery and it will have to be transported to the Netherlands to be sold there. This transportation brings extra costs with it effectively resulting in a price increase. Along with this, the extra market also brings extra demand with it which would require Jus de Mer to produce more beer. For this, extra hours and extra manpower must be used which also concludes in a price increase to keep the produce profitable.

Looking at the need for a price increase (due to transporting and producing more beer), and the difference in prices between Belgium and the Netherlands, we can see a fortunate trend. The average prices for beer in Belgium are lower than the average prices in the Netherlands. This means that Jus de Mer can easily and safely increase its selling prices without shocking the Dutch market. By just looking at the differences, a price increase of €0,20 or even €0,40 can be set without much price shock.

Transportation costs via truck will roughly equal to €370 to and from the Netherlands (Fuel cost calculator, 2022). Per truck trip, a maximum of 1500 liter is allowed to be transported at once (Gevaarlijke stoffen, 2022). This puts the required number of trips required at 7 trips given the scenario that Jus de Mer transports all its 100 hectoliters that it produces per year to the Netherlands. These 7 trips will on their turn amount to just under €2500. The price increase of €0,40 gives an extra profit of €4000. As €4000 is more than €2500, the increase in price is more than enough to cover the standard shipping costs and even extra unforeseen costs which could occur.

To summarize, a price increase of €0,40 per beer sold in the Netherlands, will still result in a fair selling price, and will generate enough extra returns to cover the shipping costs and extra unforeseen costs.

Distribution strategy

To bring Jus de Mer to the customers we will use an agent who knows the Dutch market. In the initial phase we will focus on restaurants and bars in and around the Dutch coastline. Besides the catering industry we will also focus on the supermarkets within the region of the coast.

Using an agent has advantages for Jus de Mer. A first advantage is that it is low cost. To enter a new market cost is very important element and certainly for small businesses where capital is more limited. The second advantage is the market knowledge that the agent has (Doole, I., Lowe R. & Kenyon A. 2017). It is very important that Jus de Mer establish a clear contract with the agent to ensure success in terms of sales targets and quotas. In this way, Jus de Mer can guarantee that there is a clear basis on which to build for the future.

Why Hospitality? The hospitality industry is the biggest driver of tourism for the Netherlands. In 2018, the hospitality industry in the Netherlands contributed 12 billion to the tourism sector. The Netherlands expects tourism to grow to 60 million by 2030 (Koninklijke Horeca Nederland, 2020). This is an opportunity for Jus de Mer to place itself on the map of the hospitality business.

In 2020, there were a total of 58 120 food and beverage establishments. The breakdown is as follows; 13 175 establishments in North Holland and 11 735 establishments in South Holland (Centraal Bureau voor de Statistiek, 2020).

The hospitality industry in the Netherlands has had a very difficult period due to the Corona pandemic but seems to have recovered completely. In the third quarter of 2021, sales were 14.9% higher than the same period in 2020 (see appendix 1) (Centraal Bureau voor de Statistiek, 2021). This shows that people are going back to restaurants or bars and that Jus de Mer has the opportunity to reach these people.

In addition to the catering industry, we also want to offer Jus de Mer in the well-known supermarkets in the Netherlands that have branches in the region of the coast.

The supermarkets we will be targeting are Albert Heijn and Jumbo. Albert Heijn is the major market leader within the supermarkets in the Netherlands. Its market share grew to 35% in the Corona year 2020 (Albert Heijn haalt 35% marktaandeel, maar Jumbo versnelt, 2021). Jus de Mer can benefit from this market share. By offering Jus de Mer in Albert Heijn stores, they can grow their brand awareness and become a fixture in the Netherlands as a Belgian craft beer.

Competitor Jumbo is the second supermarket we will use to distribute Jus de Mer in the Netherlands. Jumbo is the second largest supermarket in the Dutch market by market share. In 2020, their market share grew to 21.5% (Albert Heijn haalt 35% marktaandeel, maar Jumbo versnelt, 2021). Again, this can create brand awareness for Jus de Mer. These two stores also

offer tremendous growth potential for Jus de Mer. Albert Heijn has 895 stores in the Netherlands, Jumbo has a total of 686 stores (Nieuw ah, z.d.) (Jumbo Supermarkten, z.d.).

In the initial phase, we are focusing mainly in the south and coastal areas but if success is achieved, expansion can be looked at. These may include, not only restaurants and bars on the coast but also inland and available in multiple branches of the two supermarkets.

Conclusions.

To introduce Jus De Mer Blond and Double Eight into the Dutch beer industry, the marketing mix must be adapted to match the characteristics of the Dutch consumers. The many similarities between Belgian and Dutch culture allow Jus De Mer to have a good mix of standardization and adaptation of their marketing mix. To ensure successful expansion, it is important the company to stay close to its roots and emphasize its authenticity within their promotional efforts, as it gives them a unique positioning. Through the appropriate wording and visuals, Jus De Mer will be able to sell their beer as not just a product, but a whole experience. Price wise, it is concluded that an increase of €0,40 per beer sold in the Netherlands will result in a fair selling price. The use of an agent will Jus De Mer's expansion much smoother as they would have someone who is familiar with the Dutch market and can use their expertise to help formulate effective strategies. The market entry strategy will be direct exporting, as there are no language barriers or big cultural differences between the Dutch and Belgium market that would complicate the export plan of the company.

After concluding the report with our suggestions and advises about the marketing mix and the market entry strategy, we believe that Jus de Mer will be ready for entering the Dutch market in the future.

Jus de Mer has turned out to be a successful brewery in the town of Middelkerke, and now is ready for an expansion to the neighboring country, so that another market will have the opportunity to discover and enjoy the craft products of Jus de Mer. We believe the brewery has the potential needed to enter the Dutch market, and therefore we are confident to say that the Netherlands would be a great start for Jus de Mer's path to international expansion.

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GREEN INSURANCE – Insuring Solar PhotovoltaicsJona BEZATI ¹, Fatmir BËRDICA ²¹ Faculty of Economy, University of Tirana, Tirana, Albania² Managing Board Member Intersig VIG, Tirana, Albaniajona.bezati@unitir.edu.al, fatmir_b@hotmail.com,**Abstract**

Going green is a motto that shows all the practices environmentally-friendly that are created to build a better world. For the business world, this means achieving the main business objectives without harming environmental, social, and cultural aspects. This paper will be focused in insurance industry. Insurance company have taken important actions to achieve the SDG objectives. Among these objectives is the insuring solar photovoltaics. This paper aims to focus on renewable energy insurance especially on solar power (photovoltaics) insurance, since in recent months the demand for PV is growing significantly (36% in the first two months of 2022). This percentage, which is low in value, in the second quarter of 2022 has increased significantly compared to the previous period. This is also because the Albanian Government, as many other governments, has given a special importance and priority to this issue. In these conditions, it is expected that the future of photovoltaics will be growing. Businesses and also individuals are investing in order to produce energy for sales, but also for their internal consumption. A PV system is an investment not only expensive for the company that builds it, but also has a national importance for energy production. It has a special importance and it is necessary to insure it against the risks that threaten it.

The methodology will include literature review, historical and current quantitative, interviews and questionnaires with experts in the field of insurance, underwriters and actuaries in Albanian insurance companies to analyze the difficulties, problems and new opportunities that can be created by the new field of insuring solar photovoltaic. We expect that insurance companies see it as a potential market to offer green insurance products. However, this paper does not exclude the expected results for the problems that insuring solar photovoltaic may have. To underwrite a fair and comprehensive solar PV policy, underwriters will need to understand the PV technologies and products with lots of field data in order to run through their risk modeling.

Keywords: insurance, renewable energy, solar photovoltaic, risk.

JEL Classification: Q01, K32 and G22

1. Introduction- Adaptation of insurance companies towards SDG objectives

The circular economy is a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution (Julian Kirchherr, 2017). Circular economy can play an important role towards sustainable business management. In recent times, different sectors of the worldwide economy are always showing their orientation towards eco-friendly methods. In financial sector, banks have taken important actions to achieve the SDG objectives. Some of these actions are:

Innovating in financial products

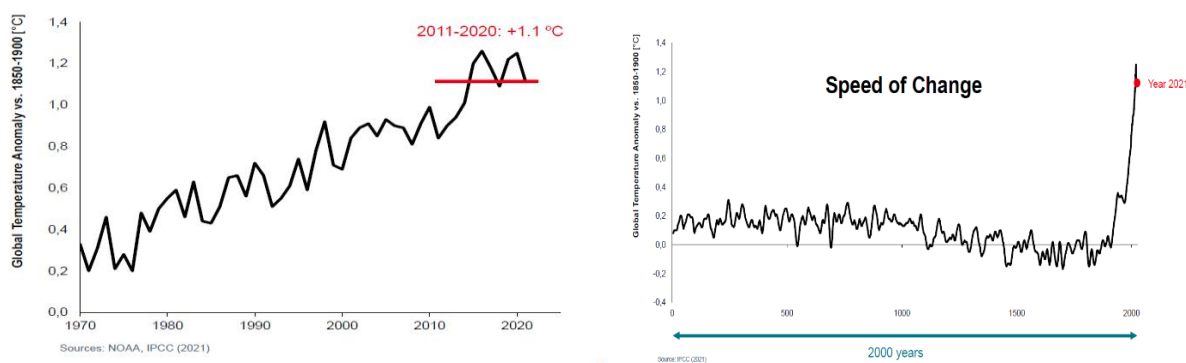
Credit facility for innovative companies

Investments in the environment and renewable energy

Investments in green bonds etc.,

A similar approach is also observed in insurance companies. Insurance companies are going green by embracing sustainable development goals through insurance that helps to protect the environment and combat climate change. In fact, the insurance sector is the sector that is most affected by the degradation of climatic conditions. As the world gets warmer, hurricanes and earthquakes will be stronger, mountain glaciers and rivers will start to disappear and mountainous regions will see more landslides and the ecosystem will collapse. In the view of the insurance world, all these effects that come from global warming translate into increased cases of catastrophic claims for insurance companies.

Table below shows the increase of global Temperature chart and the speed of change of Global Temperature:



Source: IPCC (2021)

In conditions where an insurance company has more paid claims than earned premiums, then the company is likely to go bankrupt. Therefore, climate change is particularly sensitive for insurance companies. This paper will be based on the insurance sector and the impact in the products and their adaption to the new green culture of energy production

In the large insurance companies operating in the world, taking actions and setting objectives has started a long time ago. Meanwhile, in Albania, we have not noticed the same behavior. In the insurance companies that operate in Albania, in none of their reports, web pages, products

or initiatives, there is no evidence of any action to reflect an awareness, care or prediction for the future for the SDG objectives. Since we cannot bring data from insurance companies operating in Albania, below we will reflect the objectives and actions undertaken by 2 large Austrian companies that are investors in Albania.

Vienna Insurance Group has set the objectives as follows (Vienna Insurance Group, n.d.):

No new direct investments in coal

Existing direct investments in coal will be reduced by significantly more than one half by the end of 2025 and completely eliminated from the portfolio by the end of 2035 at the latest (Based on the investment portfolio in March 2019)

Implementation of an investment strategy intentionally aimed at increasing the share of environmentally friendly investments

No direct investments in companies involved in the production or trade of banned weapons

Continuous increase of investments in green bonds

Issue of a sustainability bond

Support provided for affordable, environmentally friendly housing

The five-sustainability strategy that Uniqa Group has published are (UNIQA GROUP, n.d.):

Aligning the investment policy with ESG criteria

Incorporating ESG factors into product policy and creating additional value accordingly

Managing business in an exemplary manner in view of our environmental and social goals

Transparent reporting and willingness to obtain third-party ratings

Stakeholder management: Recognizing and collectively pursuing societal goals

2. Risk allocation in green insurance

According to the Insurance Information Institute, risk is: “the chance of loss to the person or entity that is insured”. Risks that threaten life, property and liability are the three fundamental reasons why individuals/companies are insured. The insured is willing to pay the insurance premium to transfer risks that he considers present in his life. On the other hand, the insurer, based on the probability of the occurrence of random events, other actuarial calculations, makes it possible to assume these risks and in the event of the occurrence of the event is obliged to pay the damage that occurred.

As mentioned above, the degradation of climatic conditions would increase the presence of natural risks such as floods, earthquakes, landslides, etc., risks that negatively affect the life, wealth and responsibility of individuals/companies. Consequently, the demand for insurance would increase (the premium would increase) and the damages paid by the insurer would increase.

In these conditions, awareness and care for the environment is increased for both the insured and the insurer.

The use of electric cars, green housing has increased recently and businesses are also using new methods to protect the environment. This behavior is also reflected in the change in the way of insurance. Insurance companies are starting to market products that cover the risks of these new facilities. Based on several insurers, articles, researchers, there are some types of green insurance products that can be identified (PWC):

Green Motor Vehicles Insurance: These are insurance incentives that are offered on motor vehicles that help to enhance an eco-friendly environment by reducing the amount of greenhouse gases being emitted into the environment. Common examples of Green motor vehicle insurance are: pay as you drive (PAYD), alternative fuel premium discounts, hybrid vehicle premium discounts, endorsements that allow hybrid replacement.

Green building insurance: These are products that facilitate the use of renewable materials or energies in homes or buildings and alternative building practices. This is quite different from a conventional home insurance. The transition process into a low carbon environment means that there is a movement away from fossil fuel to renewable energies. Examples of the products are: eco-friendly replacement materials endorsements, broad coverage for alternative energy sources.

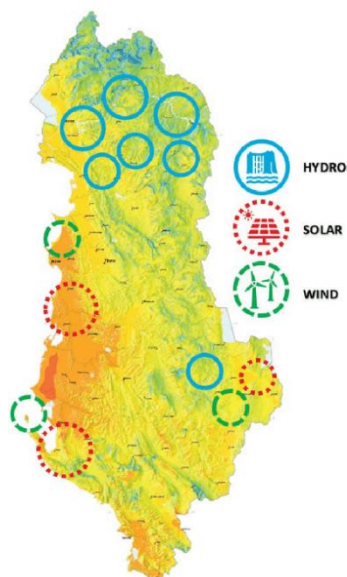
Green Insurance for Businesses: These are green commercial property insurance products. Businesses that use alternative materials and energies in their buildings and surroundings should have access to insurance that incentivize them and encourage them to keep enhancing an eco-friendly environment. Examples include coverage for installing “green” building systems and materials, coverage for “green certified” rebuilding in cases or events of total loss, green endorsement for green material and equipment as well as green construction and related costs.

Renewable energy insurance: These products offer coverages for the operators of a wide range of renewable energy business, including concentrated solar power (CSP), solar PV, wind and battery energy storage systems (BESS). We will elaborate this type of insurance in more detail in the following due to the special importance that renewable energy has in the economy.

3. The importance of renewable energy - the future of PV

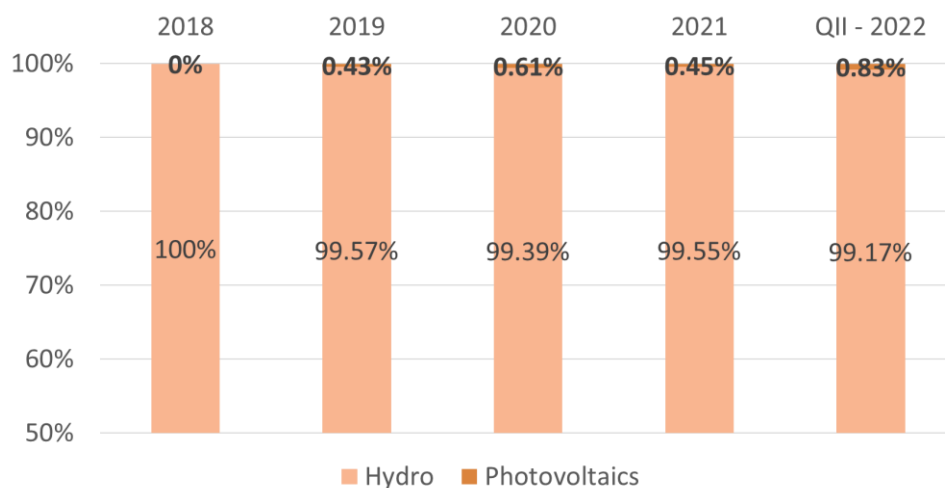
Renewable energy sources play a vital role in securing sustainable development. Renewable sources of energy can help countries mitigate climate change, build resilience to volatile prices, and lower energy costs according to World Bank. In these difficult economic and political conditions, renewable energy seems like the only solution needed, therefore, its production has increased over the years. The International Energy Agency (IEA, outlook for 2022 and 2023) says 2021's 6% growth will be followed by an 8% rise in installed capacity in 2022, led by a surge in solar power (photovoltaics).

The Republic of Albania has one of the highest shares of renewable energy in South East Europe. Hydropower accounts for the largest share of the country's electricity generation, representing around 95% of Albania's installed power capacity. As a result, the country is highly dependent on annual rainfall for electricity generation, leading to notable fluctuations in domestic energy production.



According to INSTAT statistics for the year 2021, the net production of electricity reached the value of 8,963 GWh with an increase of 68.7% compared to 2020. This production was realized by hydropower plants to the extent of 99.5% and only 0.5% of the total production came from the use of photovoltaics. Even though the production of electricity from photovoltaic power plants (photovoltaic park) is observed only in the last 3 years, the amount produced by them is a very small percentage of the total production (IRENA, 2021).

Figure 1: The weight of hydro and photovoltaics in energy production 2018-QII2022



Source: Authors' calculations

Albania currently subsidizes large-scale PV through a series of tenders. It also supports rooftop PV through a net-metering scheme. According to the latest statistics from the International Renewable Energy Agency (IRENA), the country's cumulative installed PV capacity stood at just 22 MW at the end of 2021. During the second quarter of 2022, available electricity

decreased by 3.5 %. Net domestic production of electric power in this period decreased by 38.1 %, reaching the value 1,647 GWh from 2,660 GWh of electricity produced in the second quarter of 2021. This production was realized by public hydro plants at 38.3 % of net domestic production, by independent power producers to the extent 60.9 % and other producers (Photovoltaics) that generated 0.8 % of net domestic electricity production.

Below are listed the entities that produce net production of electricity during 2021 by Photovoltaics:

Figure 2: Photovoltaic plants 2021 period

	CENTRAL FOTOVOLTAIK	MW	SUBJEKTI	LIDHJA	2021
	UKKO (pa sistemuame sistem)	1	"UKKO"sha (Ujsjell.Kanal.Korce)		
PPE	Seman – 2	2	"SEMAN2SUN" sh.p.k	35 kV	4,021
PPE	Topojë	2	"SONNE" sh.p.k	35 kV	4,001
PPE	Topojë 2	2	"AED SOLAR" sh.p.k	35 kV	4,001
PPE	Topojë (Sheq Marinas)	2	"AGE SUNPOWER" sh.p.k	35 kV	3,990
PPE	Topojë (Sheq Marinas) 2	2	"SEMAN SUNPOWER" sh.p.k	35 kV	4,049
PPE	Seman Isolar	2	" SEMANISOLAR " sh.p.k	35 kV	3,950
PPE	FV Lugano	2	ES 2019 sh.p.k	35 kV	4,304
PPE	FV SMART WATT	2	SMART WATT sh.p.k	35 kV	4,290
PPE	Tren Bilisht	2	" RTS " sh.p.k	35 kV	3,668
PPE	STATKRAFT Renewbles albani PV Lundrues banje	2	"STATKRAFT"	35 kV	13
PPE	Phug, Lushnje	2	"AEE" sh.p.k	10 kv	4,469
PPE		23			40,756

Source: ERE (2022)

4. The methodology

The methodology will include literature review which will help us to know the strategies followed by insurance companies in developed countries, in order to increase the importance of green insurance. One of the main goals of this paper is to identify the best practices based on this type of methodology and suggest them to Albanian insurance companies. Also, part of the methodology will be historical and current quantitative data published by the institutions involved in the energy and insurance markets in Albania, which will help us to create a clearer picture of the current situation and to make forecast for the future. The topic of Green Insurance in the Albanian insurance market is very innovative (especially the insurance of solar photovoltaic), for this reason, there is a lack of quantitative data. Under these conditions, it is important to conduct interviews and questionnaires with experts in the field of insurance, underwriters and actuaries in Albanian insurance companies to analyze the difficulties, problems and new opportunities that can be created by the new field of insuring solar photovoltaic.

A PV system is an investment not only expensive for the company that builds it, but also has a national importance for energy production. So, it has a special importance and it is necessary to insure it against the risks that threaten it. Natural perils, liability, loss of profit, advance loss of profit (ALOP) financial losses due to delays in construction and infrastructure projects, construction risks etc., are some of the main risks that can endanger the normal maintenance of a PV system. Based on the statistics of the Energy Regulatory Authority that show the increasing trend of energy production from PV, we expect that insurance companies see it as a

potential market to offer green insurance products. However, this paper does not exclude the expected results for the problems that insuring solar photovoltaic may have. To underwrite a fair and comprehensive solar PV policy, underwriters will need to understand the PV technologies and products with lots of field data in order to run through their risk modeling.

5. The perspective of insurance companies - Qualitative analysis

A primary goal of this paper is to identify the risks that bears Solar Systems and what insurance product are needed when insuring solar PV systems. Another goal is to provide a guide for insurance underwriters and brokers during their work when managing risk for PV systems.

In order to provide qualitative data and to understand more about the situation in Albania, five actuary and underwriters in three insurance companies were interviewed. The focus of the interview was to identify the risks that affect the PV system, the products that insurance companies offer to protect these risks and how the insurance companies foresee the future of this potential market.

The main findings of the conducted interviews are summarized below:

The new investments in the Photovoltaic Solar industry are developing further capacities in the insurance businesses. Companies are adapting their insurance products to fit the new needs of the businesses. Insurance industries in developed economies have already an experience with such industries for almost 30 years, meanwhile the Albanian insurance industry is confronted with such requests only in the last 3-4 years.

Solar technologies are still developing. The insurance industry considers the understanding of the technology and the operational performance of PV systems to be still evolving.

Most large PV systems require liability and property insurance, and many developers may opt to add policies such as environmental risk insurance. So, currently there is no special insurance product for PV system. Companies still do not think of launching such a product on the market because the demand is still low.

More specialized training related to the field is needed, in order to make the risk calculation as accurate as possible.

The risks that are more present in this type of insurance are: natural perils, liability, loss of profit, advance loss of profit (ALOP) financial losses due to delays in construction and infrastructure projects, construction risks etc.

The following section discusses insurance products from a high level; however, it is important to note that policies may vary from underwriter to underwriter and on a project-by-project basis.

General Liability Insurance

General liability covers policyholders for death or injury to persons or damage to property owned by third parties. Rooftop installations typically require additional liability insurance given the risks inherent in working on roofs and the higher likelihood of wind loading. Ground-mounted systems tend to be far from other structures and in less- populated areas, which may

reduce the premiums for general liability insurance or may reduce the requirement for additional insurance.

Property Insurance

Property risk insurance covers “damage to or loss of policyholders’ property, despite they are business or individuals owning Solar panels. While the manufacturer’s warranty will provide some limited defect coverage, the system owner usually purchases property insurance to protect against risks not covered by the warranty. Most common risk covered are Natural Catastrophe risks, Fire and related risks and also other perils such as damage from Malicious Acts, Civil Commotions or Riots, if such requested from the insured. Property insurance also protects the owner against financial loss from theft of system components. In addition, property insurance can indemnify system owners of certain natural catastrophe risk, which—according to one insurance underwriter—is the second largest risk component of property coverage after the risk of theft.

Property risk insurance also covers the transit of goods, such as material shipped to the project site, particularly for modules and components that are manufactured internationally and are needed during the construction phase or are later returned to the manufacturer for repair.

Business Interruption Insurance

Business interruption insurance is often required to protect the cash flow of the project. This coverage ensures that policyholders can recover:

1. Lost sales as a result of the system not being operational due to covered perils and loss of production-based incentives also resulting from the lack of electricity production for the same reason
2. Loss of income because of the project not being built or not being rebuilt quickly enough. (ALOP – Advance Loss of Profit)

Projects financed under third-party ownership structures generally require the procurement of business interruption coverage. Guarantee insurance as below are needed to manage the risk of fulfilling the needs.

Contractor Bonding and Construction Risk Management

Construction of PV and other renewable energy facilities entails unique risk properties and solutions. Because of an array of risks related to performance and safety, contractors and sub-contractors are generally required to be bonded (i.e., hold a surety bond to cover liens held for poor performance or misappropriated funds). Banks and insurance agencies provide contractor bonding. However, because of the minimal track record for developing renewable energy systems, all but the largest contractors are often unable to obtain bonding. Project lenders almost universally require that all contractors and sub-contractors be fully bonded relative to the value of work to be completed. Without adequate bonding, contractors may not participate in project development, thus lowering competition for contractor services.

6. Conclusion

A PV system is an investment not only expensive for the company that builds it, but also has a national importance for energy production. So, it has a special importance and it is necessary to insure it against the risks that threaten it.

Obtaining appropriate insurance can be challenging for the fledgling renewable energy industry, partly because insurance brokers and underwriters are not as familiar with renewable energy technologies and the associated risks as they are with other technologies they underwrite.

The solar PV market is booming with new producers and technology. The new opportunities created from the new technology in energy production, undoubtedly are associated with new risks. And such new risks requested appropriate insurance products that will ensure optimally the management of the risks and the protection of the newborn industry.

Based on the statistics of the Energy Regulatory Authority that show the increasing trend of energy production from PV, we expect that insurance companies see it as a potential market to offer green insurance products.

Albanian insurance companies should focus more towards SDG objectives and the provision of green products. Green insurance is a potential market in high development, therefore embracing it as soon as possible would increase the company's expansion in the market and its good name.

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Adopting IPSAS in Albanian Public Sector, their Implications and Effects in Economy

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Abstract

Public sector entities (PSE) have different characteristics from private sector entities, and this affects their organization, funding and financial structure, relations with other entities and their financial and non-financial objectives.

For the purpose of this paper, PSE will be the entities where the resources to reach the objectives are provided or directed by the government, and where some or all of the public services provided by the organization are defined in their statute.

Findings

Currently, a set of rules and guidelines have been issued to guide the development of accounting and financial reporting of PSE in Albania. But are these entities ready to adopt the Accounting Standards, known internationally as IPSAS, which were designed by the IFAC Board of IPSAS to provide them with a basic reporting framework that will provide reliable and useful information for providers of funding sources and users of public services.

Scope

In this paper, we will address how these standards are developed and implemented in practice, their impact on financial statements, the scope of their implementation, along with the challenges of their implementation. We will also explain what is the position of our country in relation to this reporting framework.

Originality/value

The paper contributes to the literature on PSA harmonization, through an innovative analysis of PSA, both at national and international levels. Through a study with descriptive and comparative analysis will be carried out to see the possibility of aligning the current regulation with IPSAS, the scope for adopting new rules in accordance with these Standards and the development of a sustainable reporting model.

Keywords: PSE, IPSAS, Accrual Accounting, Comparative Analysis

Jel Code M41, C42

Public sector entities means governments and all publicly controlled or publicly funded agencies, enterprises, and other entities that deliver public programs, goods, or services.

Public sector entities have the same characteristics with private sector entities in terms of general accounting accepted principles (GAAP), accounting techniques, accounting concepts

and almost all the steps required to analyze and journalize transactions till the end of accounting cycle that is preparation and presentation of financial statements. But they have also different characteristics from private sector entities in terms of capital funding, owners, purpose, focus, and this affects their organization, funding and financial structure, relations with other entities and their financial and non-financial objectives. Public sector organizations have externally set financial objectives and targets, and this influences the format and presentation of their financial statements published for general and specific purposes and overall the financial reporting in public sector. One of the main objectives is the use of public funds efficiently and effectively and this requires public sector entities to demonstrate financial accountability. Financial reporting in public sector helps in decision-making and in increasing accountability, and transparency. It also helps to improve the performance of, and trust in, the public sector. The financial statements are required to give a true and fair view, or present fairly in all material respects, the financial results and position of the public entity. This means the financial statements should be materially correct and unbiased. It aims to provide useful and reliable information to the users of financial statements. This is achieved when the information meets the qualitative characteristics of faithful representation, relevancy, comparability, understandability, verifiability and timeliness.

In order to meet or to tailor the needs of the public and their representatives, and all other stakeholders, International Public Sector Accounting Standards Board (IPSASB) as an independent standard-setting body issued and published Accounting Standards (IPSAS), designed to apply to the general-purpose financial reports of all public sector entities that meet the following criteria:

Mainly finance their activities, directly or indirectly, by means of taxes, bonds, fines and other charges and / or transfers from other levels of government, social contributions, debt or fees;

Are responsible for the delivery of services for the benefit of the public and / or to redistribute income and wealth; and

Do not have a primary objective to make profits.

International Public Sector Accounting Standards (IPSAS) are a set of accounting standards issued by the IPSAS Board for use by public sector entities around the world in the preparation of financial statements for these entities. IPSAS are widely used by government and intergovernmental organizations or institutions. IPSAS do not apply to government business enterprises so called enterprises that are performing public services in supplying the public and other entities with commodities such as water, electricity, gas, etc. IPSAS aim to improve the quality of general purpose financial reporting by public sector entities, leading to better informed assessments of the resource allocation decisions made by governments, thereby increasing transparency and accountability.

There are two types of IPSAS: Cash basis and accruals basis. There is currently only one cash basis accounting standard. The standard, Financial Reporting under the Cash Basis of Accounting was revised and re-issued in 2017. It comprises two Parts – Part 1 of the standard is mandatory for all public sectors preparing financial statements under the cash basis; Part 2 is not mandatory, but identifies additional accounting policies and disclosures that

organizations are encouraged to adopt in order to enhance the usefulness of financial statements. The standard includes guidance on the transition process from cash to accruals basis.

When the cash basis of accounting underlies the preparation of the financial statements, the primary financial statement is the statement of cash receipts and payments that can be matched with the budget

When the accrual basis of accounting underlies the preparation of the financial statements, the financial statements will include:

- the statement of financial position (IPSAS 1),
- the statement of financial performance (IPSAS 1),
- the cash flow statement (IPSAS 2),
- the statement of changes in net assets/equity (IPSAS 1),
- the notes to the financial statements, or annex (IPSAS 1).

Whilst the IPSASB hopes that all jurisdictions and their central and local government entities will eventually be able to adopt an accruals-based accounting system, following the requirements of the cash basis IPSAS will nevertheless enhance transparent and comprehensive financial reporting. There are 42 accruals-based IPSAS and they focus on revenue, cost, assets, liability and equity, rather than only reporting cash transactions.

What are the benefits of economy in applying IPSAS?

IPSAS implementation / accrual accounting helps:

- to improve quality of financial reporting for general purposes
- to increase consistency and comparability
- to enhance transparency and accountability from the PSEs
- to harmonize accounting standards for the public sector in the European Union membership;
- accounting system include all the information in the PSEs
- to strengthen confidence in financial management and control in PSEs

IPSAS adoption will also improve the management and reporting of assets, liabilities, revenues and expenditures. Giving requirements for assets and liabilities recognition, IPSAS will significantly increase the comprehensiveness of the asset register for the public entities and will give accurate figures for the current liabilities and public debt. They will also produce more accurate and complete inventory records as well as strengthened internal controls for assets and inventory maintenance to ensure accuracy of their amounts in financial statements. Management of PSEs will therefore be better able to make decisions on how assets should be used, to evaluate their useful life, potential replacements and maintenance requirements.

Furthermore, budgetary requirements will better reflect needs based on the underlying condition of assets.

IPSAS based in accrual accounting will improve also the reporting of Revenue and Expenses. Both items will be recognized and reported when the transactions are happening. IPSAS will provide a consistent and accurate basis of recognition of revenue and expenses and will facilitate the monitoring and reporting of associated cash balances, liabilities, outstanding payments to and from the public, and receivables and payables at year end. Under IPSAS, revenue and expenses can be recognized earlier and under certain conditions, which has the potential to improve the financial position and financial performance of the entities.

At the end, IPSAS adoption will improve the quality of financial information and enables alignment and comparability across PSEs and will help consolidating information for reporting purposes. Financial reports will become more transparent, making it easier for the users to have a more comprehensive view of the financial position, its performance and cash flows of the entity for any given period. Moreover, the stakeholders are in a better position to assess how well the public sector entity utilized the available resources to achieve the intended targets and objectives.

An increasing number of governments have adopted, or are in the process of adopting, the accrual basis IPSAS. Some are adopting IPSAS directly whilst others are adopting IPSAS through their own national standards. Various international organizations have also adopted IPSAS, including the UN, the OECD, NATO and the EU.

Many governments are introducing IPSAS because it is considered to be good practice. However, very few governments have actually adopted the standards. The main problem is the key requirement to produce consolidated financial statements for all controlled entities.

Over 80 countries, along with many international organizations, including the UN System Organizations, have adopted, or are in the process of adopting, IPSAS, either directly or indirectly. Australia, New Zealand, the US, the UK, France and Canada are among the early adopters of accrual accounting and have been reporting purely on an accrual basis since the 1990s.

What is the situation of IPSAS and accrual accounting adoption in Balkan Region?

The West Balkan countries actually use cash basis accounting rules and some of them are in process of revising the accounting rules towards adopting accrual basis accounting standards in line with IPSAS.

In Bosnia and Herzegovina and in Montenegro the public sector entities report on the cash basis of accounting. There are no plans to adopt IPSAS in Bosnia and Herzegovina in the short term period, while Montenegro is moving towards the adoption of accrual-based accounting and implementation of IPSAS-based accounting standards. Public Sector Accounting Law is effective from January 1, 2002 and aims at aligning public sector accounting with international accounting standards, facilitating fiscal statistical reporting and strengthening public sector

governance. The main focus is to provide necessary information to manage effectively liabilities and assets of the public entities⁷⁴.

In Croatia is applied modified cash basis accounting rules. There is a plan to adopt European Public Sector Accounting Standards as Croatia is now a full member of European Union.

Having adopted the cash-basis IPSAS in 2004, the Republic of Kosova was among the first countries in the world to issue financial statements complying with the cash-basis IPSAS. Many institutions and agencies present subsidies and transfers to government business enterprises, however, government business enterprises are not consolidated in financial statements as required by the Cash IPSAS.

Macedonian government is in the process of adopting the cash basis IPSAS, and in the future will move to adopt accrual basis IPSAS. The Agency for financial support of agriculture and rural development, as well as the National fund within the Ministry of Finance use IPSAS accrual basis for the purposes of reporting to the European Commission on the use of the IPARD (Instrument for pre-accession assistance in rural development) funds.

Serbian Government applies cash accounting. Law includes requirements to comply with Cash-basis IPSAS.

What about Albania?

Currently, a set of rules and guidelines have been issued to guide the development of accounting and financial reporting of public sector entities in Albania. But are these entities ready to adopt the Accounting Standards, known internationally as IPSAS, which were specially designed by the IPSASB for public sector entities to provide them with a basic reporting framework that will provide reliable and useful financial reports for providers of funding sources or their representatives and users of public services or their representatives? The decision to adopt IPSAS from the Government of Albania and its agencies published in 2019 in the Draft Strategy Action Plan, Public Financial Management Reform Project should be seen in the context of wider reforms in accounting and auditing. This is an important point in terms of implementation and planning. There are examples of governments in arrears making the decision to implement IPSAS, but failing to achieve that successfully as they had not properly considered the other reforms necessary to enable the accrual accounting basis to operate effectively.

The reforms that have taken place in the Government of Albania, or are in process, include the following⁷⁵:

Improvement of information systems used to complete the national accounts

Internal audit function reforms.

International (IFRS) and national accounting standards based on IFRS, implemented in the private sector

⁷⁴ Centre for Excellence and Finance, 2020

⁷⁵ Draft Country Strategy and Action Plan, PFM Reform Project 2019, IPSAS adoption and implementation.

Debt and fiscal consolidation, to ensure long-term sustainability of public finances.

Initial progress made in 2007 as the first attempt to move to accrual accounting when at the same time it was translated the version of full IPSAS.

World Bank Report on the Enhancement of Public Sector Financial Reporting, 2017, in the context of accounting and auditing reform in Albania

IPSASB have identified three main approaches (options) to implement IPSAS:

Option 1: Full and direct adoption of IPSAS: It is required a new legislation that makes a direct reference to full IPSAS for adoption for all public sector entities.

Option 2: Full but indirect adoption of IPSAS: All IPSAS are adopted through national public sector accounting rules which are fully compliant with IPSAS.

Option 3: Partial adoption of IPSAS: National public sector accounting rules are modified and/or are newly issued that are consistent with a few parts of selected IPSAS.

What is the best option for Albania?

The first option is not adequate due to the structure and tradition of the Albanian public sector entities. It requires developing capacities and at the same time crossing toward a package of rules that differ essentially from current rules. The second and the third option is more relevant for the Albanian environment, with national accounting standards issued in line with IPSAS, and the third option more applicable due to a simpler nature and structure of public entities, with option 3, more adequate for a partial adoption of IPSAS across the public sector entities of Albania, as it recognizes and mitigates the risks associated with the ongoing wider Public Financial Management (PFM) reforms, and balances internal capacity development and questions around the adoption of IPSAS (or 'EPSAS') across Europe, particularly in light of Albania's prospective to be considered for EU membership.

The Government of Albania is committed to the gradual introduction of a modern system of public sector accounting based in international standards. Public accounting in Albania has been carried out on a cash basis and recognizing elements of assets and liabilities in accrual basis. In accordance with Albania's PFM Strategy, the government decided to make a gradual transition to accrual accounting aligned to International Public Sector Accounting Standards (IPSAS).

Based on other countries' experiences regarding the public sector accounting regulatory framework, that have successfully implemented accrual accounting reform, and also with the basic features of the Albanian regulatory framework in public sector, the best approach is to adopt a simpler version of IPSAS, but relevant to the local Albanian context. So, the best option is to modify the current accounting rules and to adopt some of the international standard partly, that is the indirect approach to the implementation of IPSAS, although every effort will be made to follow the IPSAS closely to allow maximum flexibility. A gap analysis is made by an Albanian Ministry of Finance team which concluded that there are some consistencies and inconsistencies between Albanian public sector set of accounting rules and IPSAS for each standard. Also, not all the IPSAS are relevant for the Albanian context and not all the parts of a standard are applicable in the Albanian context. Therefore, IPSAS will need to be adapted

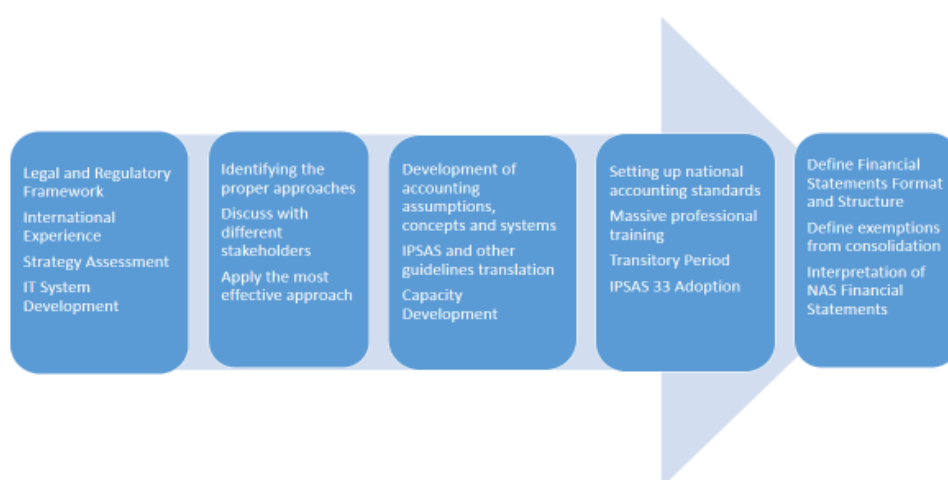
and modified, in order to be more effectively applied in Albania. IPSAS are standards that allow accountants to have professional judgment for different accounting cases related with recognition, evaluation and preparation of the financial transactions. The risk is, if original IPSAS are applied, this will allow accountants to make their own professional judgment for different accounting cases. This could present a major issue when completing the consolidated public financial statements. In Albania, standard practice is a *rule-based approach*, which has been consistently applied, and is centralized, supported by detailed instructions and guidance from the set of accounting and reporting rules approved by the Ministry of Finance. The current approach provides accountants with concrete and specific accounting principles to ensure a clear understanding of requirements and avoid any inconsistencies in the application of the accounting standards. This means that some of the original IPSAS are not aligned with the local country approach and cultural expectations regarding the accounting cases but may be adopted and modified. To avoid this, it is required to have unification of some criteria for all the elements related with the accounting principles across the public sector in Albania.

Given the cultural environment in Albania, a centralized approach to the adoption and implementation of a part of IPSAS is deemed to be the optimal solution and to develop accounting guidelines, templates and instructions for Ministries and other agencies to follow in line with IPSAS but relevant to Albanian context. This allows for consistency in application and is the established accepted approach.

In addition, it is required a capacity development to secure greater understanding of IPSAS, to help the implementation and to provide support and advice on better use of resources, and help deliver better public financial management.

Phased implementation

With the ambition of phased accrual IPSAS (as adapted) adoption by Albanian public sector entities it is sensible to stage the adoption process in clearly defined phases, as outlined in this road map:



This is a road map that clearly identifies all the stages to be implemented by Albanian authorities in order to have a set of national accounting rules in line with IPSAS, which is only one of a lot of EU *acquis communautaire* matching requirements.

References:

Draft Country Strategy and Action Plan, PFM Reform Project 2019 in Albania, IPSAS adoption and implementation

Perspectives of Implementation of International Public Sector Accounting Standards (IPSAS) and Transition to Accrual Accounting in Montenegro, published by Centre for Excellence and Finance, 2020.

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IPSAS web page: [www.ifac.org/public sector](http://www.ifac.org/public-sector)

Proposing a legal framework through the development of new domain specific languages (DSL) in compliance with GDPR

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Abstract

The adaptation of company processes to the EU Regulation represents a major opportunity to review, update and improve the internal processes and management tools used by the enterprises. The loss of data, unauthorized access or transparency lacking in the communicated procedures of data manipulation and storage might cause tangible and intangible damage to the enterprises. The GDPR legislation therefore represents an opportunity and a stimulus to verify the management methods applied, to define an organizational model and a code of conduct (policies, processes, rules / provisions and controls) capable of improving internal processes, defining and achieving desired objectives, ensure data and systems protection with proper risk management and assessment. This paper presents the principles of the LegalRuleML applied to the legal domain of General Data Protection Regulation (GDPR) and discusses compatibilities of LegalRuleML with a potential DSL for modeling norms. Internally adopted GDPR privacy consulting and BPM mapping are analyzed in order to comprehend their impact in developing a domain specific language that refers to internal. LegalRuleML allows inconsistent renditions of a legal source to coexist in the same LegalRuleML document and provides functionality to identify and select interpretations.

Keywords: LegalRuleML, framework, business, process, GDPR, enterprises

1. Introduction

This paper represents an in-depth analysis of the different specific problems and technological requirements that a domain specific language has. We have examined some aspects of the needs of a company and also realized the classification of the specific domain. Several analyses have been made, like the analysis of the methods applied for the DSL and the development of new programming languages for specific purposes.

After further verifying and studying the framework [3], it results that it serves to derivate DSPML from a generic BPML which sufficiently addresses the needs expressed in this literature. By using this artifact, the engineering of domain-specific process modeling languages can be methodologically grounded, which structures and systematizes the development process. This case leads to an increased adequacy and quality of resulting

languages, which need to be designed towards increasingly complex requirements driven by domain, technology and end-user. However, a framework which integrates existing knowledge regarding the DSPML development by highlighting required building blocks has not yet been proposed as an idea which can serve/explain or give a solution to this issue.

BPM (Semantic Business Process Regulatory Compliance Checking using LegalRuleML) is the development of tools being able to design business processes graphically. However, nowadays BPM-s are also managed meaning that the process modeling tool has been integrated into some process management system which controls the process execution and integrates other parts of the information system. It is known that companies are subject to regulations. Non-compliance to such regulations would affect the added value of business processes and result to judiciary pursuits. When it comes to BPM, when checking the compliance of a business process by considering relevant regulations, it means identifying if a process violates or not a set of norms.

To ensure business processes are compliant we need two components:

A conceptually sound formal representation of a business process

A conceptually sound formalism to model and reason with the norms derived by the regulations

The purpose of this paper is to build a framework starting from a specific problem analysis and requirements so could potentially fit the customer needs in the market. The paper is organized in 4 parts. Section 2 and 3 will give a brief overview of all related studies and literature reviews in the domain specific language focusing mainly in studies on LegalML Framework.

In this framework, is analyzed an application of the semantic business process regulatory compliance checking the semantics of the LegalRuleML regarding the representation of the norms and its dynamics. Different ways to analyze and model the semantics of norms and their dynamics. There is also shown/explained how the semantic modelling phase can address, improve and also answer the needs for compliance checking of the companies.

Section 4 will address to all the techniques and technologies needed to design possible patterns and entity relation mappings taking in account GDPR as legal domain. Section 5 will discuss results and future work.

2. Terminology

The question what exactly is a domain-specific language is subject to debate. We propose the following definition:

“A domain-specific language (DSL) is a programming language or executable specification language that offers, through appropriate notations and abstractions, expressive power focused on, and usually restricted to, a particular problem domain.”

The key characteristic of DSLs according to this definition is their focused expressive power. Our definition inherits the vagueness of one of its defining terms: problem domain. Moreover, we refer to [9], which contains an interesting discussion contrasting a “domain as the real world” point of view as adopted in the artificial intelligence community, with a “domain as a set of systems” approach, as used in the systematic software reuse research community. DSLs are usually small, offering only a restricted suite of notations and abstractions. In the literature they are also called micro-languages and little languages [10].

Sometimes, however, they contain an entire general-purpose language (GPL) as a sublanguage, thus offering domain-specific expressive power in addition to the expressive power of the GPL. This situation occurs when DSLs are implemented as embedded languages (see Section 5). Domain-specific languages are usually declarative. Consequently, they can be viewed as specification languages, as well as programming languages.

A common term for DSLs geared towards building business data processing systems is 4th Generation Language (4GL). Related to domain-specific programming is end-user programming, which happens when end-users perform simple programming tasks using a macro or scripting language. A typical example is spreadsheet programming using the Excel macro-language.

3. Related Studies

We give some general evidence to the Business Process Management (BPM) and an introduction to the DSL literature. More about specific references is given at appropriate issues throughout this article rather than in this section.

Until recently, Domain-specific process modelling has gained increased attention, since traditional modelling languages struggle to meet the demands of highly specialized businesses and there are a few books on the subject. We mention paper [5], a framework for creating domain-specific process modeling languages. In this article we have explored two frameworks for developing a domain specific language, a meta-model framework and a framework based on RuleML called LegalRuleML.

To study the first framework, referred in [6], a collection of articles on designing the digital transformation especially designing a framework for the development of domain-specific process modelling languages which indicate a framework that is a result of 23 requirements

from relevant literature and contains essential building blocks that need to be considered during the development process.

Frank, U [7], focuses on the requirement analyses defining the scope and purpose of the DSPML, stakeholder and building blocks; and Barron [8], focused on defining guidelines to support a DSL developer to achieve better quality of the language design and a better acceptance among its users.

To study the LegalRuleML we referred on those articles that are focused in capturing alternative interpretations or renderings of a legal source we suggest to referred LegalRuleML framework. LegalRuleML gives the possibility of mutually incompatible renderings of a legal source to coexist in the same LegalRuleML document, and provides facilities to identify the interpretations and to select them. Legal documents are the source of norms, guidelines, and rules that often feed into different applications.

Guido Gorvenatori presents the principles of the OASIS LegalRuleML applied to the legal domain and discusses why, how, and when LegalRuleML is well-suited for modelling norms. Ho-Pun Lam shows how the semantic annotations can be used to empower a business process (regulatory) compliance system and discusses the challenges of adapting a semantic approach to legal domain.

4. DSL Design Methodology

The purpose of this paper is to analyze and study a computer system, dedicated to the management of internal GDPR privacy consulting with the use of relational DBs and specific domain languages (DSL). We need to understand why it is important to develop a specific domain language that refers to internal GDPR privacy consulting and BPM mapping and how to develop a domain specific language.

To develop a domain-specific language, we will focus on a legal framework such as the GDPR LegalRuleML which consists of capturing alternative interpretations or renderings of a legal source. LegalRuleML allows mutually incompatible interpretations of a legal source to coexist in the same LegalRuleML document and provides functionality to identify and select interpretations.

4.1. GDPR LegalRuleML Framework

Developing a domain specific language is not an easy process. It required both developing and analyzing knowledge. The process of developing a specific domain language, pass through some essential steps like decision, analysis, design and implementation.

Decision: The decision is the first phase of DSL development. This phase is connected with "when" part of the DSL development. Deciding in favor of a new DSL is usually not easy. Investing in the development of DSL must pay for itself after more economical development and / or maintenance of the software.

Analysis: In the DSL development analysis phase, we will identify the main problem and gather the knowledge of the domain. In this project the main problem in the generation of GDPR documents and in the automation of internal processes. To do this it is necessary the contribution of experts of the domain or the availability of documents or code from which it is possible to obtain knowledge of the domain. We have selected domain analysis methodologies such as those described in the third phase, design phase.

Design: The design phase it will be followed by a model-based design, in which the design models are a distillation of common wisdom in the organization of the structural parts, of the grammar and of the constraints of a language and of the orthogonality criteria, in which the constructs of language are independent of each other, thus allowing their systematic combination. Within GDPR LegalRuleML we introduce five design models.

container, which is a structure of elements with independent existence (example:

<Context> can include several <Association> sub-elements;)

collection, a sub-frame of the container that comes in the form of a list of elements of the same type (eg. <Roli> or a sequence of <Roli> elements);

recursive element (example: <Obligation> may include other <Obligation> elements);

marker, an element that uses the @same attribute. Regarding the identification of a source (example: <lrml: LegalSource key = "" sameAs = "" />)

composite elements made up of different dependent parts (example: a <Rule> rule) consists of a previous <if> and a <then> conclusion).

Implementation: The implementation models we have identified are interpreter, application compilation / generation.

In the interpreter model, DSL constructs are recognized and interpreted using a standard fetch-decode-execute cycle. This approach is appropriate for languages that have a dynamic character or if speed of execution is not a problem.

The advantages of interpretation over compilation are greater control over the execution environment and a simpler extension. While, in compiling / generating applications, DSL constructs are translated into basic language constructs and library calls. On the DSL program or on the specifications, a complete static analysis can be performed. DSL compilers are often called application generators. The principles we are considering for building the GDPR LegalRuleML framework are the following.

Multiple semantic annotations: a legal rule can have multiple semantic annotations, where these annotations represent different legal interpretations. Each annotation appears in a separate annotation block as internal or external metadata. A set of parameters provides the interpretation regarding the origin, the applicable jurisdiction, the logical interpretation of the rule and others.

Linking rules and provisions: GDPR LegalRuleML includes a mechanism, based on IRI, which allows many (N: M) relationships between rules and textual provisions: more rules are incorporated in the same provision and different provisions contribute to the same rule. This mechanism can be managed in the metadata block, allowing an extensible management, avoiding the redundancy in the definition of IRI and avoiding errors in the associations.

5. Implementation

To begin with the design of the data management process, the first step is logical data modeling, which is a method of discovering the data, relationships and rules of a company, collectively defined as a business rule, and forms the basis of physical data modeling, which deals with aspects of the physical development of the database model.

The work for logical data modelling usually begins in the requirements analysis phase, directly when the project team studies the business requirements. Starting from the initial requirements and after subsequent detailed analyses, system analysts construct an initial data model for the representation of company data and processes. Extraordinary, on the transition between the systems analysis phase and the systems design phase, the data model is improved and obtains other details. Finally, in the systems design phase, the data model is established in a final version and the changes must be confirmed both by the customer and by the project team.

Changing the data model in the later stages of development or testing is not a good thing at all, especially when it comes to relational databases. Therefore, the logical data model should be defined from the beginning of the development of the system and it is not necessary to change it later. Relational databases, as indicated above, offer many advantages in terms of data integrity, consistency, transaction management, which are vital points in this project. Most modern applications must be able to recover data as quickly as possible. And that's when you can consider de-normalizing a relational database. In this project we have denormalized the focal points of the databases in order to optimize performance and improve data recovery.

The normalization process brings the data together in an organized way to eliminate redundancies, in other words, the denormalization process can be considered as the process of putting a fact in numerous places. This can have the effect of speeding up the data recovery process, generally at the expense of modifying the data. Instead of trying to de-normalize the entire database, in these automation projects we focused on particular parts in order to speed up the document generation process. However, developers should use this tool only for particular purposes.

We have used denormalization in the cases necessary to perform a calculation repeatedly during the queries, it is advisable to archive the results in the main table. Even in cases where a normalized database requires the merging of many tables to retrieve queries, we have added redundancy to the databases by copying the values between parent and child tables. This situation occurs when DSLs are implemented as embedded languages as this Domain-specific language. Consequently, they can be viewed as specification languages, as well as programming languages.

Mapping: The GDPR automation process is designed based on the legal framework GDPR LegalRuleML and the best practices that the regulation recommends to respect. The main purpose of GDPR automation is to help our corporate customers better align with the new EU GDPR legislation.

The first step in designing the data management process is to discover the data, relationships and rules of business logic. As the backbone of this system will serve the organizational module. This form will store data starting from basic information such as their name, site address, website, contact person and other detailed information related to the GDPR Regulation. For more information, the GDPR LegalRuleML requires organizations to legally keep records of processing activities under their responsibility and to make it available to the competent control authority upon request. For this purpose, a module, processing activity is required.

The form processing activities will represent the register of all databases processed by the organization. The set of data that they process and store in their organization will only be a record that will contain all the databases or data processed.

All data processed by the organization are analyzed and classified into categories such as human resource data, research and development data, customer / supplier data or other particular data. The form of personal data categories will contain all the categories of data that a company processes. In other words, all databases are divided into n categories of personal data, which is a one-to-many relationship. A class of personal data categories will contain the databases that are processed, for example the human resource data categories will contain information on employees, health, CV candidates, etc. To speed up the data recovery process, the database register is de-normalized according to the automatic template system generation and also used in other modules that will be presented in the following section.

The denormalization of data in this case will improve the recovery of data from different related modules and through them we will be able to create expressions and workflows to more easily merge data from related modules. In terms of business logic, it is important to define correctly because it provides a framework not only on the classes of responsibility, but also through them we define the control of data access for each employee included in one of these categories of personal data and finally all the data that the respective categories can view, modify, store, process or delete.

4. Conclusion and Future Work

This article is an original investigation undertaken in order to acquire new knowledge that consists of a new specific domain language directed mainly towards a specific objective, practical or objective as the automation of management processes to respond positively to the GDPR and allow to exploit these data from the commercial point of view. The article is to create a DSL based on the GDPR LegalRuleML framework.

GDPR LegalRuleML is a framework that can be mapped to RDF triples to reuse the linked data. The GDPR automation process is designed on the basis of this framework and of the best practices that the regulation recommends to respect, which will help our business customers to better align with the new EU GDPR legislation. Has been achieved in this scientific paper will guide our future work, that includes also the evaluation of the internal system with larger processes, and applying this methodology with other kinds of regulations in order to make the system more flexible to the needs of the companies adopting it.

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Implementation of Big Data technologies in Accounting

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Abstract

For many years the business environment has been in evolution because of technological changes, new means of communication and market globalization. With all of these changes many companies have been looking to shape the best way of using their resources in order to dominate their market.

This new technological era has made major changes also in accounting. Accounting information is crucial in decision-making and the companies need this information to be reported on a daily basis, on real time and with high accuracy from their accounting information systems (AIS). On many cases the only goal of companies implementing an AIS is to get that report or information which is more relevant than any other information in business processes.

Using an AIS in Albania has had a growing tendency during the recent years, from standard software packages up to more complex ones and ERP-s.

Keeping in mind the business environment in Albania, where companies that have thousands of accounting transactions per day are few, we emphasize that big data implementation is not a known concept.

This thesis will try to respond these 3 following questions:

What are AIS and their evolution in Albania?

What are Big Data technologies in accounting?

What is the impact of the implementation of these technologies?

We will try to answer these questions with a deep analysis that the authors have made regarding to AIS implementation in different companies, AIS market analysis and a case study where the author has implemented a Big Data technology in accounting in one of the biggest Albania Corporation, Albanian Post.

Keywords: AIS, Big Data technologies, RabbitMQ, Accounting, Reporting.

Introduction

Even in Albania, many businesses use AIS to register, process and report their accounting data. Initially, these AIS were used to record simple accounting data, later with the growth of transactions number and globalization, businesses have gone towards "Easy ERP or ERP-s. All this change has come because of the need for accurate information in decision-making. Not always using an ERP is affordable, because of their costs and difficulties in implementing them.

Using First we have to say that in Albania, primarily, the use of standard accounting systems prevails, and very few economic entities have shifted to ERPs, or to use technologies other than the program they have. The first, this comes about the fact that these technologies have a certain cost, which cannot be afforded by Albanian businesses.

Secondly, these technologies require very good knowledge from informatics to manage and want an ongoing update.

Another very important element in shifting towards a new and more modern system and platform is also the opposition that employees can make to the fact that they have worked a long time with a certain system and change seems very difficult.

In businesses that have large volumes of transactions a continued effort to improve their processes has been observed, as this improvement brings to bring about a huge cost reduction and a good performance in the distribution of products and services. In this work with businesses that have large volumes of transactions refer mainly to banks, including an anonymous society like Albanian Mail in which two technologies are implemented that will be dealt with later in the works.

Yet the economic entities that have made the decision to move towards new technologies have managed to create a new standard in their management. They are not only better positioned in the market but have easily expanded it as for them managing a new service/product on the part of costs is easier.

Literature review

AIS is a software that businesses use to collect, store and process accounting data that management uses in making decisions. To simplify it, AIS gives precise data to managers before making any significant decisions.

Accounting Information System is seen as a subsystem of management information systems, and its primary function is to process accounting transactions, as well as non-financial transactions that directly affect the processing of accounting transactions (Hall A., 1998, page. 9)

The syndicate information system (According to the Rome Conference, September 2012) is a complex system, made up of elements, rigorously interconnected such as information data, human resources, IT tools, models and accountable procedures, essentially collecting, classifying, processing, recording and storing accounting data.

In general, the AIS that dominates our market is the standard one, with general functions, built to suit the needs of most of the businesses. At a small corner of our market are businesses with specific requirements, which need more flexibility form an AIS like configuring new modules, building new reports, increasing the software performance in terms of speed. Apart from ERP -s that have a relevant cost for Albanian businesses, there are some Big Data technologies that can fit these requirements within a short period and with low cost, which is very important in our business environment. One of them wil be discussed in this paper, RabbitMQ.

RabbitMQ is a queue that buffers, prioritizes and roots message traffic. RabbitMQ is a high-performance message broker based on the Advanced Message Queueing Protocol. It's battle tested, ultrafast, and powerful enough to handle anything you can throw at it. It requires a few simple setup steps, and you can instantly start using it to manage low-level service communication, application integration, and distributed system message routing.

(Gavin M.Roy, Rabbit in Depth, pg 45)

RabbitMQ, an excellent resource for beginners and experts ... together. It can easily be integrated within a successful accounting information system. (Ian Dallas, Hewlett Packard)

RabbitMQ is a quick "escape" from the huge data traffic. (Alvaro Videla, Jason J.W. Williams, RabbitMQ in Action)

Tools and methodology

We have collected data form primary and secondary sources. First of all, we have made a literature review about accounting information systems and one of the most powerful Big Data technologies as RabbitMQ. In addition we have created a questionnaire and send it to different professionals that have implemented AIS and Big Data technologies.

This questionnaire is mainly focused on different technologies that are used as add-ons or complements to an AIS and what is their role in processing more faster accounting data and increasing system performance.

This paper contains also a deep review on how RabbitMQ is implemented in one of the biggest corporation in Albania, Albanian Post.

After all this primary and secondary data is collected, it has become their analysis based on simple math calculations, their appearance by means of graphs and comparative figures and techniques.

Discussion and analysis

RabbitMQ is a message distributor: he accepts and delivers messages. It can be explained as a post office: when you place the envelope you want to post in a mailbox, you are sure that after some time it will be delivered to the recipient. As for analogy, RabbitMQ is a mailbox, a post office and a postmaster.

The biggest difference between RabbitMQ and the post office is that the queue does not deal with letters, but it accepts, preserves and distributes data. (In this work with "data" and "messages" we will refer to financial/accounting data, such as: recording a cash receipt, recording a cash payment, etc).

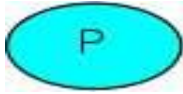
This technology has been implemented in the services that Albanian Post provides on 563 offices across Albania. As transactions occurring within a day were thousands (nearly 40,000 transactions a day), it needs a solution that will afford this data traffic. The big advantage of the queue-RabbitMQ is that transactions are posted in real time in accounting. So within a maximum time of 3 seconds all cash payments and cash receipts will be posted in General Ledger.

Does this data traffic affect AIS performance?

Absolutely not. The queue-RabbitMQ uses an asynchrone method, meaning that as the message comes in line, AIS does not wait for the accounting transactions to be posted in General Ledger but get the signal that the transaction was posted after the process has ended. An asynchrone method allows many records to occur at the same time. For this reason it is not a problem posting thousands of accounting transactions over a short period of time and without creating database problems and to slowdown the AIS.

Producer(Sender) - is the element that produces the event, the data. This could be the system/application that Albanian Post use in postal offices.

Figure 1. Data producer



Source: rabbitmq.com

The queue – it's a "mailbox" located inside RabbitMQ. Messages/accounting transactions coming from the Producer are recorded in a queue. Picture 1.3 shows a picture of how a queue looks like.

Figure 2. Queue

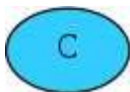


Source: rabbitmq.com

Many producers can send data that goes into a queue, and many consumers can get data from there.

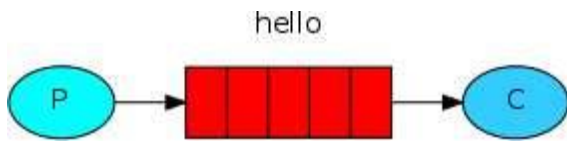
A consumer is a program/software that tries to get data.

Figure 3. Consumer



Source: rabbitmq.com

Figure 4. Link between Producer-Queue-Consumer



Source: rabbitmq.com

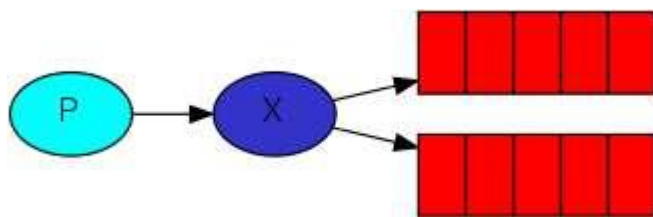
The main idea of the messaging model at RabbitMQ is that the queue never sends a message directly in line.

Instead, the manufacturer can only send messages to a bridge called “Exchange”.

The exchange is a simple platform: on one hand you get messages/data from the Producer and on the other hand it pushes them to different queues. An exchange needs to know precisely what to do with a given message/data.

The connection an exchange and the queue is called "Binding".

Figure 5. Exchange



Source: rabbitmq.com

Based on the names that are setup for the exchange and the two queues, we send data at the right destination. The exchangers are determined that certain kinds of messages will be sent to the first queue, while other types will be sent to the second queue.

Message Recognition

A task/message may need up to a few seconds to process. In order that no message is lost, RabbitMQ has an option called "message recognition." "Recognition" is a feedback that the Consumer sends to the queue when the message is processed successfully and in this case it can be deleted.

What happens if a consumer starts to consume a message but for a certain reason this process fails?

If the consumer fails in getting a message and does not give a feedback to RabbitMQ about his status, then RMQ will realize that the message has not been fully processed and will once again throw it in queue.

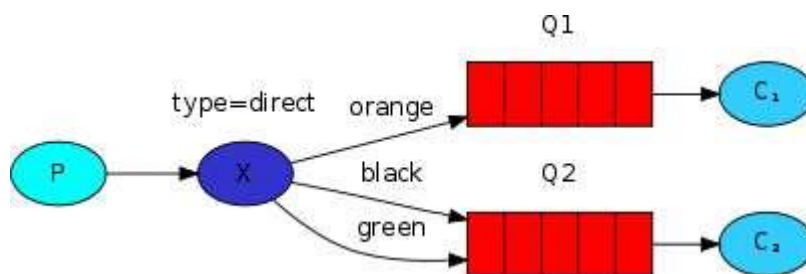
If at the same time there is another consumer that is online, then the message will shift towards this consumer to be processed. In that way we make sure the message is not lost.

Routing

The producer sends all messages produced by the application. But these messages are initially processed by the exchange under a specific condition (type=direct). Then there is another condition, which will filter messages to the respective Q1 and Q2 queues.

All messages that meet the clause "orange" condition will be directed to Q1, while all messages that meet the condition "black" or "green" will go to Q2.

Figure 6. Conditional messages



Source: rabbitmq.com

Use case – RabbitMQ implementation on Albanian Postal Service

The producer – Eterna Web is the system that postal offices use in Albania to record all the payments made by citizens or businesses. Examples of payments: electricity bill, police penalty, school fees, business taxes, local taxes, etc.

All of the transactions above have a code, which is unique.

For all of these transactions we have configured in a specific excel all the accounts that need to be posted in GL for each payments that is done in a postal office.

Figure 7. RabbitMQ Implemented in Albanian Post

Refreshed 2018-09-27 02:17:52 Refresh every 5 seconds Virtual host: All
Cluster rabbit@EternaLiveSQL.postashqiptare.al User rabbitadmin Log out

Overview Connections **Channels** Exchanges Queues Admin

Exchanges

▼ All exchanges (9)

Page 1 of 1 - Filter: Regexp ?

Displaying 9 items, page size up to: 100

Name	Type	Features	Message rate in	Message rate out	+/-
(AMQP default)	direct	D	0.00/s	0.00/s	
GeneralExchange	fanout	D	0.00/s	0.00/s	
TestExchange	fanout	D	0.00/s	0.00/s	
amq.direct	direct	D			
amq.fanout	fanout	D			
amq.headers	headers	D			
amq.match	headers	D			
amq.rabbitmq.trace	topic	D i			
amq.topic	topic	D			

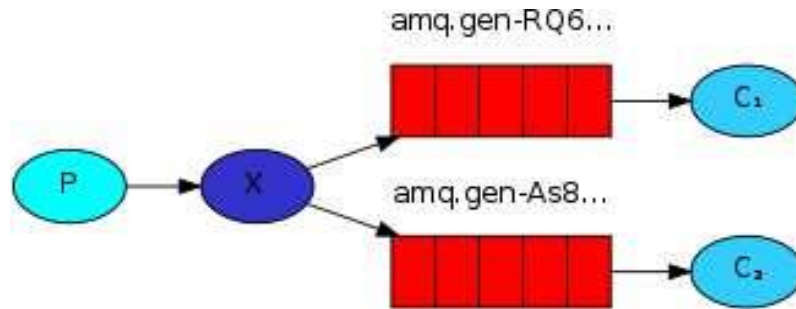
▶ Add a new exchange

HTTP API Server Docs Tutorials Community Support Community Slack Commercial Support Plugins GitHub Changelog

Source: authors

As the payment transaction complete the conditions to be posted in GL, they are sent to :accounting queue”.

Figure 8. Sending messages with "accounting" condition



Source: rabbitmq.com

All transactions that are enter in a queue are identified by the document number, transaction reference and document date.

RabbitMQ is an app that can be accessed online from any place (office, home), as long as we have a computer connected to the internet. This app uses the "Cloud" technology.

Through this app, the performance of the posts in the accounting of the various actions is also controlled. Here we can see how many transactions are posted, how many are left unposted, how many are in line and waiting. We can also look at the total number of transactions posted in accounting, their performance over the day.

P-Producer, Eterna Web. X-Exchange(Queue), the location in which transactions with Condition=Accounting Mq.gen-RQ6 are filtered.

C1-Consumer, is the GL where all the accounting transactions are posted.

The figure above shows two queues where the accounting transactions pass . In both queues we have consumers who consume the messages. So both post into general ledger..

If the consumer failed to get an accounting transaction, then RabbitMQ sends it back in queue to consume it again.

Figure 9. Accounting Queue and General Queue in Albanian Post

The screenshot shows the RabbitMQ web interface. At the top, there is a navigation menu with 'Overview', 'Connections', 'Channels', 'Exchanges', 'Queues', and 'Admin'. The 'Queues' tab is active. Below the navigation, there is a 'Queues' section with a dropdown for 'All queues (3)'. A pagination bar shows 'Page 1 of 1' and 'Filter:'. A table displays the following data:

Overview		Messages				Message rates		
Name	Features	State	Ready	Unacked	Total	incoming	deliver	get ack
AccountingQueue	D	idle	1,163,677	0	1,163,677	0.00/s	0.00/s	0.00/s
GeneralQueue	D	idle	0	0	0	0.00/s	0.00/s	0.00/s
TestQueue	D	idle	0	0	0	0.00/s	0.00/s	0.00/s

Below the table, there is a link 'Add a new queue'. At the bottom of the page, there is a footer with links: 'HTTP API', 'Server Docs', 'Tutorials', 'Community Support', 'Community Slack', 'Commercial Support', 'Plugins', 'GitHub', and 'Changelog'.

Source: authors

In addition to this use case that we presented in this paper, we have gathered information about big data technologies in accounting using a questionnaire. We sent it to 82 accounting and IT professionals in order to see their knowledge about this topic and how they rate these technologies among all other IT solutions, like ERP-s. Most of them have heard about RabbitMQ, but only 2 of them has implemented it in business solutions. This was because on their opinion, it takes time to configure. But the other 2 that have implemented RabbitMQ confirm that they have had a higher performance in their system, real time accounting reports and better decision making. *The SQL life has become easier.*

One of the biggest finding of this questionnaire is also that there are some companies that in order to process this numerous data(thousand to millions per day), they wait the end of the day to execute the transactions . So we need to wait for the next day to check the updatet data. This is an example on how banks and microcredits systems works in Albania.

Conclusions and recommendations

AIS provides a big help in the daily business management. They help to record accounting transactions, save the documents, maintain a correct relationship with third parties, build standard reports, monitor/control employers performance and analyse the entity's overall performance. You can have all this information by using a standard AIS.

When the business increase the number of transactions, it becomes difficult to manage the business life with a standard AIS.

According to the authors opinion there are two possibilities to solve this situations: The first is to switch to an ERP system which has a very high cost for the Albanian market and the second one is to use AIS add-ons, like big data technologies but they need good IT knowledge.

Going for the the second solution, we considered RabbitMQ which helps businesses with large accounting transactions to increasing the speed of posting these transactions into general ledger(GL) and the quality of accounting reports.

RabbitMQ is a very simple app, which avoid data "traffic" in the large number of transactions of a bank or any other entity that has thousands of transactions per day. This app also perfectly saves all the transactions and posts them to general ledger.

Another element of this app is that despite the large number of accounting transactions, the system will not go down in any case because it is an asynchronous app and system performance is always stable.

The moment when you receive business information and the accuracy these reports are key elements in today's business environment. Apart from speed, it's important to provide information with high quality, because based on this information, they will make important decisions.

Therefore businesses nowadays are paying higher attention to AIS investments, since a good system means high quality informations and this later helps to increases business value.

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Empirical Evidence on Circular Economy and Economic Development in Albania

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Abstract

The circular economy is taking on great importance, especially due to the rapid climate changes that have been occurring in recent decades. On the other hand, economic development is considered the most important indicator of determining the standard of living, desired to be achieved by governments targeting economic, social, and environmental benefits. For this reason, there has been interest from many researchers to examine and evaluate the relationship between the circular economy and economic development. Numerous studies show a strong relationship implying that the more advanced circular economy, the greater the impact on sustainable economic growth. While other studies claim that despite the positive aspects of the environment and the economy of developed countries, it can leave poor countries out of the supply chain. The main purpose of this paper is to analyze the dependencies and causes of the circular economy and economic development in Albania. The research objective includes testing whether the recycling rate of national waste, the generation of urban waste per capita and the research and development actual expenditure affect gross domestic product per capita. The data were provided by the Ministry of Finance and Economy, INSTAT and EUROSTAT and cover the period 2013-2020. The results show a positive and statistically significant relationship between the variables analyzed, except the generation of urban waste per capita. This paper aims to help policy makers and public managers in the design of government policies that specifically affect the circular economy.

Keywords: Circular Economy, Economic Development, Recycling, Urban Waste, Empirical Evidence

Jel Code: C51, O11, Q56

Introduction

Economic development is considered the most important indicator of determining the standard of living of the citizens in a country. In this context, economic development is the indicator that every government wants to achieve through the objectives and policies it undertakes. On the other hand, there are many challenges faced by the countries, such as economic, social and environmental challenges. Climate changes in recent decades have directed not only researchers, but also policy makers and businesses towards searching for new economic models that best address these challenges.

The circular economy is the economic model that is replacing the linear economy. But what is in the core of the circular economy? What are the benefits or disadvantages of implementing this economic model? What is the EU doing to become a circular economy? What is Albania doing to become a circular economy? Is there empirical evidence that supports the impact of the circular economy on the economic development of a country? All these questions will be addressed and analyzed in this paper, where the main focus is the empirical analysis of the impact of the circular economy variables on economic development for Albania.

According to Ellen Macarthur (2022), the circular economy is a systems solution framework that tackles global challenges such as climate change, biodiversity loss, waste and pollution. It is based on three principles driven by design: the elimination of waste and pollution, the circulation of products and materials (at their highest value) and the regeneration of nature. The circular economy is supported by a transition to renewable energy and materials. The transition to a circular economy involves decoupling economic activity from the consumption of finite resources. This represents systemic change that builds long-term sustainability, generates business and economic opportunities, and provides environmental and societal benefits. Meanwhile, according to Ozkan, and Yucel (2020), the linear economic model starting with the industrial revolution consists of production and consumption mechanisms in which resources are returned into waste after a single-use. Those mechanisms ignore the environment and have to return processes. Due to the unidirectional flow and eventual depletion of resources, this structure has been considered to be linear.

If we refer to the Circularity Gap Report of 2021, the global economy is only 8.6% circular and sets an ambitious target to become about 17% by 2030 targeting high potential sectors for change.

However, the circular economy is being promoted by the EU and is being implemented to replace the linear economic model. In March 2020, the European Commission has presented the circular economy action plan, which aims to promote more sustainable product design, reduce waste and

empower consumers, for example by creating a right to repair. Albania as well has undertaken some initiatives to promote the circular economy.

In this paper, the impact and causality between the circular economy and economic development in Albania will be analyzed. The research is conducted on the time-series data of the selected variables. The research question is: Do the recycling rate of national waste, the generation of urban waste per capita and the research and development actual expenditure influence in a statistically significant way the gross domestic product per capita?

The results show a positive and statistically significant relationship between the variables analyzed, except the generation of urban waste per capita implying that the more advanced circular economy, the greater the impact on economic development.

In the first section, the theoretical background is discussed with respect to literature, and as well initiatives undertaken by EU and Albania. In the second section the methodology, specification and limitations of the model are presented. The result of the research is presented in the third section and finally, the paper is concluded with some conclusions and recommendations.

Literature Review

Economic, technological and environmental changes occurred last years due to challenges faced by the countries. These changes require new economic models in order to ensure the economic development of countries, as one of the most important indicators that measure the standard of living. For this reason, many researchers have searched for a new economic model that basically utilize reusable by-products.

The circular economy is a model of production and consumption that involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. At the core of the circular economy is extending the life cycle of products, reducing waste to a minimum. This means that when a product reaches the end of its life, its materials are kept within the economy wherever possible. These can be productively used again and again, thus creating further value (Afteni et al., 2021).

Currently, more than 100 different definitions of the circular economy are used in the scientific literature and professional journals. However, definitions often focus on the use of raw materials or system change. Definitions that focus on resource use often follow the 3-R approach: Reduce (minimum use of raw materials); Reuse (maximum reuse of products and components); Recycle (reuse of high-quality raw materials). Whereas, Korhonen et al., (2018) indicated that definitions

that focus on system change often emphasize three elements, such as: Closed loops; Renewable energy; and systems thinking.

The circular economy model is a departure from the traditional, linear economic model, which is based on the take-make-consume-throw model. This model relies on large quantities of easily accessible materials and energy. In a circular economy, waste does not exist and products and raw materials (designed to be) reused as long and intensively as possible over and over again. Waste is the new raw material (Ellen Macarthur (2022)).

McKinsey (2015) found that it is important to decouple economic growth from resource consumption. Increased income from new circular activities, together with cheaper production by getting products and materials more functional and easily disassembled and reused, has the power to increase GDP and thus economic growth. Meanwhile, it turns out that the developed EU countries generate more waste but also have better indicators of circular economy application. On the other hand, to achieve better results in the less developed countries of the world, it is necessary to invest more financial resources in activities such as R&D, new technology development and innovation. Also very important is the better involvement of customers in activities that promote a circular economy. In this context, the application of the circular economy concept can ensure economic growth and increase GDP by reducing the use of natural resources and ensuring greater environmental protection (Sverko et al., 2020).

Moreover, according to European Parliament source (2022), environmental economists (and economists in general) consider that the circular economy creates growth as it e.g., it increases resource and energy efficiency and creates added value when materials are used several times instead of only once. Also, the transition to a circular economy can bring benefits such as: reduced pressure on environment; improvements in the supply of raw materials; increased competition and innovation; stimulation of economic growth; and the creation of new jobs.

According to Micheline et al., (2017), the circular economy is a trend in response to inefficient management of resources in the traditional linear model. Governments have claimed this change and the business community is seeking new business models to conduct them on this transition. Therefore, the concept of the circular economy is based on two simple ideas: on the one hand, the awareness that what is considered waste can be reused as a resource; on the other hand, the need to decouple economic growth from the use of natural resources.

Georgescu et al., (2022) analyzed the impact of recycling rate of national waste, generation of municipal waste and R&D expenditure on GDP per capita for 25 EU countries and resulted that except generation of municipal waste, recycling rate of national waste and R&D expenditure had a significant positive relationship with GDP per capita.

The circular economy is a stable, sustainable and inevitable alternative which is able to face the challenges. The collection of concepts that make up the circular economy enables the reduction of waste, including the reuse of components of goods according to design through closed loop and cascade approaches, containing the economy's dependence on material and energy inputs, increasing the sustainability of the economic system, preserving the environment, meeting the growing demands of an increasingly populated planet and increasing the operability and cost efficiency of production (Sariatli F. 2017).

Concerning the recycling rate, Fellner and Lederer (2020) concluded that it is probably not the best indicator to measure a country's circular economy level because the direct link between reduced primary raw material demand and higher recycling rates is only an assumption. While, according to Knäble et al., (2022), the results show no significant effect of recycling rate on GDP per capita.

What is the EU doing to become a circular economy?

The European Commission has presented in March 2020 the circular economy action plan, which aims to promote more sustainable product design, reduce waste and empower consumers, for example by creating a right to repair. In February 2021, Parliament adopted a resolution on the new circular economy action plan, calling for additional measures to achieve a carbon-neutral, environmentally sustainable, non-toxic and fully circular economy by 2050, including rules stricter recycling and binding targets for material use and consumption by 2030. In March 2022, the Commission published the first package of measures to accelerate the transition to a circular economy, as part of the circular economy action plan. Proposals include promoting sustainable products, empowering consumers for the green transition, revising construction products regulation and creating a strategy for sustainable textiles.

What initiatives has Albania undertaken?

Some initiatives have also been undertaken in Albania on the circular economy. The project 'Highlighting the Circular Economy - as a new approach for an active society', supported by Co-Plan, funds of the European Union. ENV.Net also had the reinforcement of critical thinking in order to increase the understanding of the circular economy through practical approaches of models in the daily life of cities. The activities focused on increasing the capacities of NGOs and youth for the circular economy, through workshops and trainings, to actively contribute to practical models of the economy in their cities. It was also aimed at undertaking initiatives for dialogue between citizens and local authorities in the development of potential circular economy schemes in the city.

Another project is "Circular and green economy, opportunities for promoting an active society and economic development in the municipalities of Patos and Roskovec". This project aimed to increase the understanding of concrete action for circular and green economy through practical approaches of models in the daily life of citizens and businesses. Also, the project aimed to identify businesses with potential orientation towards a green and circular economy in the Fier district, as well as to increase information at the local level on the benefits of circular and green economy.

The project "Increasing the awareness of CSOs and SMEs on the importance of the circular economy in accordance with the EU Circular Economy Package" aims to create awareness and education for the general public and stakeholders on the Circular Economy strategy of EU, aiming towards a sustainable low carbon, resource efficient and competitive economy.

Also, discussion forums were held with the citizens of Tirana Municipality, as well as lectures were given at the Faculty of Natural Sciences and at the Faculty of Civil Engineering.

Meanwhile, in 2020, the National Sectoral Plan for Solid Waste Management was approved, where the current situation of waste management was analyzed, and measures were proposed to address the identified problems. This document is developed on the vision or perception of the concept of "zero waste", so that waste is collected and treated as raw materials and management is done in accordance with the concept of circular systems, serving the criteria of using and preserving resources of raw materials. However, according to the European Environment Agency (2021), the main challenges in the implementation of the legal framework for municipal waste are related to public awareness and the lack of systems and infrastructure for special collection and treatment, as well as the lack of enforcement mechanisms.

However, despite these initiatives, in a questionnaire distributed on the recognition of the concept of the circular economy, or the measures taken by the Albanian government for the transition to the circular economy, only 51.5% of the respondents know the concept of the circular economy, while only 6.1% of them have knowledge of the government's strategic documents for the circular economy. What reinforces the lack of knowledge about this economic model is the fact that 33.3% of respondents work in the public sector, of which only 1% have information about the government's strategic plans for the circular economy.

Methodology and Specification of the model

This study focuses on the causality between GDP per capita and the recycling rate of national waste, the generation of urban waste per capita and the research and development actual

expenditure. GDP per capita is the dependent variable, while the other variables are independent. The definition of the variables is given in the table 1.

Table 1: The definition of the variables

Variable	Description
GDPC	Gross Domestic Product per Capita
RRNW	Recycling rate of national waste (% of total waste generated)
GUWC	Generation of urban waste per capita (kg per capita)
R&DEXP	Research and development actual expenditure

Source: Author (2022)

The model to be estimated has the form:

$$\text{Log(GDPC)}_t = \beta_0 + \beta_1 * \text{log(RRNW)}_t + \beta_2 * \text{log(GUWC)}_t + \beta_3 * \text{log(R\&DEXP)}_t + \epsilon_t$$

The coefficients β are the estimated coefficients of the independent variables.

The data cover the period 2013-2020 and were provided by the Ministry of Finance and Economy, the Ministry of Education and Sports, INSTAT and Eurostat. The chosen model uses time-series data and is built on a database consisting of 8 observations for Albania. The model is estimated using the E-views 7 program, which is a statistical program for econometric studies. The limitations of this model are: small number of observed time series data (8 observations) conditioning the analysis and does not leave much room for choosing the econometric method, for making a more complete analysis of the causality between variables. This is due to the lack of data for some of the variables included in the analysis; Lack of data for regional countries to make a more complete assessment of the causality of the variables for Western Balkans.

Result of the research

In this section it is presented the estimation of the model and the interpretation of the results of each of variables. OLS method is used for the regression. This method involves several assumptions which are tested prior to the evaluation of the model. Based on the regression data, the results are as follow:

$$\text{Log(GDPPC)} = 5.8 + 0.21 * \text{log(RRNW)} - 0.01 * \text{log(GUWC)} + 0.2 * \text{log(R\&DEXP)}$$

(0.12) (0.002) (0.04)

$$R^2 = 96\% \quad Fv = 32.54 \quad n=8$$

Based on the regression, recycling rate of the national waste has a positive impact on economic development represented by GDP per capita. 1 percentage point increase in RRNW leads to 0.21% increase on GDP per capita. Generation of urban waste per capita has a negative impact on GDP per capita. 1 percentage point increase in GUWC leads to 0.01% decrease on GDP per capita. Research and development actual expenditure has a positive impact on GDP per capita, so 1 percentage point increase in R&DEXP leads to 0.2% increase on GDP per capita.

$R^2 = 96\%$ which means that 96% of the GDP per capita variation is explained by the independent variables of the model. One can see that all coefficients are statistically significant.

Conclusions and recommendation

The focus of this paper was on the economic development of Albania and empirical evidence of the RRNW, GUWC, R&DEXP in the economic growth process. Positive statistically significant relations were observed for RRNW and R&DEXP and negative impact for GUWC. It was noted a lack of awareness of citizens, CSO and businesses on the circular economy.

However, the results imply certain policy recommendations, such as designing innovation policies aiming to reduce waste generation and to increase waste recycling capacity. Furthermore, awareness on circular economy should be raised. The current legal framework needs to be improved in order to increase the country's ability to better utilize its resources and the life cycle

of materials, products and services. Also, to further go in depth to this economic model, an empirical analysis could be done in the future for the Western Balkans.

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Tirana Universities Innovative Approach towards Environmental Sustainability

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Abstract

Economic, social and environmental stability (ES) are today an important matter to various fields of economy. Governments and public have raised their attention and awareness related to better usage of natural resources, greener economy, recycling and circular usage of products. In line with the 17 sustainable development goals of the United Nations, ES is a matter of high concern globally. Education institutions are an important factor in this.

The paper aims to explore current approach of universities operating in Tirana, capital of Albania, towards ES goals, by analyzing inclusion of the ES concept in a) university syllabuses and b) scientific research, as well as in c) current operations inside the universities and in d) HR practices. Being ES a new concept in Albanian reality, the paper's approach is to bring some insights related to universities innovative initiative to diffuse these concepts to students, businesses and public.

The research uses quantitative and qualitative analysis; university professors were reached out. From the quantitative data, came out that 14% of university professors reached out for the purpose of the study don't include ES knowledge in their respective fields of study and 80% have little to moderate inclusion of the concepts in their subjects, and only 6% of them have good coverage of these concepts in their syllables. This study also studies the gaps in the actual universities' syllables with other syllables of business schools abroad, to explore what improvements can be made for the future.

Data gathered brought out a certain level of involvement of public and non-public universities operating in Tirana in international projects concerning ES, most of them funded by EU. A notable initiative is "Strategy for Environmentally Friendly University 2022-2027" developed by the University of Tirana.

Keywords: Environmental stability (ES) in higher education curriculum; ES in higher education scientific research; Higher education operations towards sustainability; ES; Innovative approach to sustainability.

Jel Codes: Q01, Q5

Introduction

Sustainability in our society is becoming crucial. Sustainable development has gathered the focus of universities, businesses and government, becoming an ecosystem important variable.

According to ‘Our Common Future’ report from the United Nations (UN), sustainability acts to “meet the needs of the present without compromising the ability of future generations to satisfy their own needs”ⁱ

The Commission sees sustainable development – ‘in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change, are made consistent with future as well as present needs, as an immediate imperative and continuing essential.’ⁱⁱ

The Sustainable Development Goals, also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.ⁱⁱⁱ

It has come to understanding that sustainability is now an important factor for countries, governments and citizens.

Sustainability consists of three fundamental dimensions, including social, economic, and environmental aspects. A growing number of organizations have been integrating environmental and social responsibilities into their business strategies alongside more traditional business imperatives, such as profit maximization, cost reduction, revenue growth, and quality improvement.^{iv}

Holistic view of business ethics requires to embrace sustainability development in terms of triple bottom line, integrating social, environmental, and economic responsibilities.^v

In order to provide awareness and information to people regarding the importance of sustainability it is important to include its concepts in education. Sustainability education among students is

essential, because they represent the future of each country. They can be ambassadors of sustainability in their future occupations, own startup-s, government representations.

To achieve sustainable development goals, industry, universities, and governments need to be change agents to realize the benefits of sustainability in the industry and among students. Academia has its core role in making this objective possible.

This study is mostly related to the concern that universities have for environmental stability (ES), namely inclusion of ES concepts into curriculum and scientific research, and how everyday operations as well as HR (HR) practices of these universities are oriented towards ES. The study is driven by data collected from Tirana universities, mostly public ones. The majority of them are in business education. The study used a mixed research methodology of a quantitative and exploratory survey through a questionnaire and a qualitative observation through syllabuses analyses.

Three research questions were raised concerning ES.

Research Question 1. What is the level of ES concepts included in current university syllabuses?

Research Question 2. What is the level of ES included in universities research projects and initiatives?

Research Question 3. To what extent current internal operations and HR practices take into consideration ES in the universities studied?

To obtain the required research objectives the paper is organized in seven sections. In Section 2 we review the sustainability literature review and focus more on ES, section 3 explains the methodology used for this paper research, section 4 explains the results, section 5 analyses of the questionnaire, reviews the discussions, limitations and future considerations for this research field in Albania.

Literature Review

According to ‘Our Common Future’ report from the United Nations (UN), sustainability acts to “meet the needs of the present without compromising the ability of future generations to satisfy their own needs”. The

Commission sees sustainable development – ‘in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change, are made consistent with future as well as present needs, as an immediate imperative and continuing essential (UN,1987).

Furthermore, to this first consideration, the 2030 Agenda for Sustainable Development is a plan of action for people, planet, and prosperity that unites global development goals in one framework. It comprises integrated and indivisible 17 Sustainable Development Goals (SDGs) that balance the three dimensions of sustainable development: the economic, social, and environment. The fourth sustainable development goal (SDG4), i.e. quality education, is intended to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all, and has been appointed as the universal education goal.^{vi}

There are challenges that need to be addressed for the success of Sustainable Development implementation. It is apparent that the current economic, social, cultural, and political backgrounds of the cluster countries can be major constraints to the success of ESD implementation. (UN, January 2021)

Universities play a fundamental role in addressing global environmental challenges as their education, research and community involvement can produce long-lasting environmental effects and societal change. By demonstrating best practice in their operations, research and teaching, universities have both multiple and multiplier effects on society. For universities to comprehensively address sustainability, a 'learning for sustainability' approach needs to be embedded across every aspect of institutional operations in a synergistic way.^{vii} High education institutions (HEIs)’ initiatives and activities on ES are in different areas: in research, in education, campus operations, community engagement/outreach, institutional framework, on-campus experiences, and assessment and reporting.^{viii} Therefore, the HEIs play a catalytic role in societies’ engagement with sustainability.^{ix} Providing sustainability awareness to students requires

educational institutes to adapt their vision, policy, teaching, and in particular their curriculum.^x However, the extent of curriculum 'greening' appears to be limited by internal, interdisciplinary barriers, requiring governmental assistance and student pressure to effect greater change.^{xi} Nevertheless, given their collective knowledge and research capacity, there is a moral responsibility for universities to educate future leaders and to advance knowledge that can lead to the creation of a sustainable environment.^{xii}

Suitable education is needed by both individuals and spatial planning professionals and at all levels of education. It is therefore necessary to transform some of the academic programs in the higher education curriculum by integrating teaching content and methods that include long-term knowledge and holistic thinking, taking into account the importance of interdisciplinary integration.^{xiii}

Little research has been conducted in Albania for such concepts, therefore there is a need to address such matters. Following the literature line of thinking and importance of sustainability in higher education, we worked by measuring the current involvement of this concept to Tirana Universities by analyzing a survey conducted to higher education professors in order to investigate their inclusion of ES concepts into curriculum and scientific research, as well as operations of these universities that are studied.

Methodology

To obtain all relevant information and come to conclusions regarding ES in Albanian Universities a mixed methodology was used.

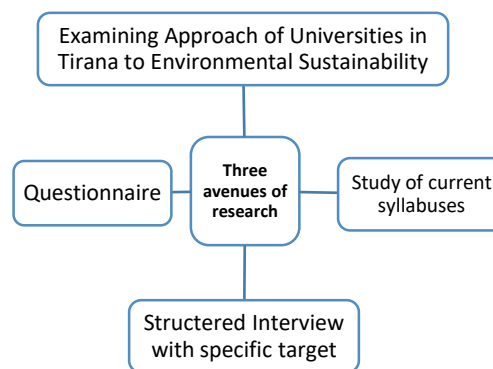
The first method used is the qualitative exploration of current syllabuses used by some public and non- public universities in Tirana, Albania. A comparison with syllabuses of other countries' universities (USA and Canada), mostly business schools like Darden School of Business-University of Virginia, Scheller College of Business-University of Georgia, McGill University in Montreal, Wharton-University of Pennsylvania, was of help in paving the way of understanding. Subjects' syllabuses from universities teaching in economics and business field, as well as specific sustainability subject syllabuses were taken in consideration.

The second method used is a questionnaire that was conducted among university academic staff to investigate the level of inclusion of ES concept in their syllabuses, research projects and operations, as well as in HR practices towards sustainability.

The third method used was a structured interview with specific professors, who reported to have included ES in their teaching curricula and/or research projects. From all the professors that included sustainability in their syllabuses and research projects, the ones that were part of managerial positions in the universities were of more interest. Using the third research method we were able to explore in depth the relevant fields that were related to ES and provide some insights regarding the specific subjects and projects in ES.

Below it is shown a more detailed figure of research methodology used (Figure 1).

Figure 1. Research Methodology



Questionnaire

The Questionnaire for gathering data from academic staff was organized in five sections that included information on: Demographic statistics of participants; Inclusion of ES in school syllabuses; Inclusion of ES in scientific research; ES and operations; Academic/ non-academic staff training level on sustainability practices. It was adapted and put in Albanian context from Sustainability Assessment Questionnaire (SAQ) for Colleges and Universities from Sustainable School Organization (Calder 2008).^{xiv} There were used two types of questions, open questions-for gathering specific information related to projects, subjects and multidisciplinary centers, and closed questions-with a five level Likert scale for evaluation. The Likert scale answers vary from 0-no sustainability inclusiveness, 1- little sustainability inclusiveness, 2 - moderate sustainability inclusiveness, 3- good sustainability inclusiveness and 4- very good sustainability inclusiveness.

The questionnaire was distributed through Google Forms, as it allowed to collect and analyze the data in a more convenient and easier way.

3.2 *Aimed Reading of Syllabuses*

Syllabuses of some universities operating in Tirana and offering education in business, were qualitatively assessed to investigate the inclusion of ES concepts. For reference were taken into consideration the latest syllabuses submitted to university departments, for 2022-2023 academic year. Specific consideration was given to those syllabuses mentioned by respondents in open questions in questionnaires.

A comparison was conducted with western universities syllabuses. For lack of space, only findings for Albanian syllabuses are summarized in Table 8.

3.3 *Structured Interviews*

Structured interviews were the third step of this research and included more detailed information regarding specific initiatives, projects, institutions, programs and strategies from Albanian academic institutions regarding ES. Specific topics that came out from questionnaire, were followed up through interviews. Public documents of universities operating in Tirana regarding their research and developing projects were also consulted.

Results

Around 40 professors were reached out and their responsiveness level was around 83%. A total of 33 responses were considered for the analysis. A list of universities taken in the study is in Table 1.

Demographic data of the respondents is presented in Table 2.

Table 1. List of participating Universities/Faculties

Number	University Name	Department	Public/Non-public
1	University of Tirana, Faculty of Economy	Faculty of Management	Public
2	University of Tirana, Faculty of Economy	Faculty of Finance	Public
3	University of Tirana, Faculty of Economy	Faculty of Economics	Public
4	University of Tirana, Faculty of Economy	Faculty of Marketing	Public
5	Epoka University	Business Administration	Non-Public
6	Epoka University	Economics	Non-Public
7	Metropolitan University	Business Administration	Non-Public
8	Mediterranean University	Business Administration	Non-Public
9	Mediterranean University	Accounting	Non-Public
10	Logos University	Business Administration	Non-Public

Table 2. Demographic characteristics of respondents

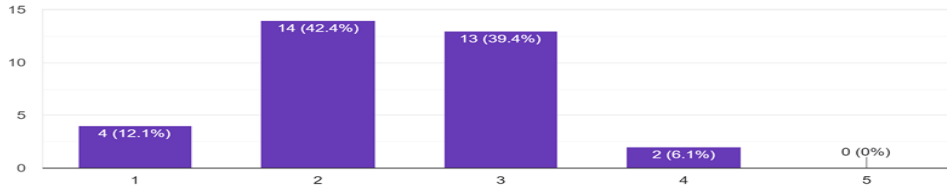
Demographics		N (%)
Gender	Female	24 (73%)
	Male	9 (27%)
Position	Managerial	8 (24%)
	Professor	25 (76%)
Work experience in a HI	Up to 5 years	6 (18%)
	5 to 9 years	5 (15%)
	10-20 years	14 (43%)
	More than 20 years	8 (24%)
Public/Non-public (33)	Public	26 (79%)
	Non-public	7 (21%)

4.1 Results for questionnaire “Assessing ES in universities in Tirana through academic staff”

Questionnaire was used to assess current level of inclusion of ES concept in public and non-public Universities in Tirana, mostly those offering education in economy and business. Academic staff was asked about level of inclusion of the concept in current syllabuses, in dedicated subjects, in scientific research, in current university operations, in HR practices, etc.

Results of all respondents regarding inclusion of ES concept in current syllabuses are shown in Figure 2.

Figure 2. ES inclusion in current syllabuses. Source: data from questionnaires



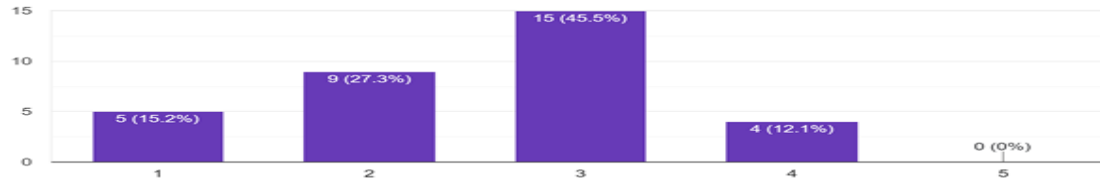
Results by sector public and non-public are shown in Table 3.

Table 3. Level of sustainability inclusion in syllabuses

Level of sustainability inclusion in syllabuses in non-public universities	Level	Level of sustainability inclusion in syllabuses in public universities
0 (0%)	1-not at all	4 (16%)
4 (57%)	2-little inclusion	10 (38%)
3 (43%)	3-avarage inclusion	10 (38%)
0 (0%)	4-good inclusion	2 (8%)
0 (0%)	5-very good inclusion	0 (0%)

Results of all respondents regarding inclusion of ES in current scientific research are shown in Figure 3.

Figure 3. ES inclusion in current scientific research. Source: data from questionnaires



Results by sector public and non-public universities is shown in Table 4.

Table 4. Level of sustainability inclusion in syllabuses

Level of sustainability inclusion in scientific research in non-public universities	Level	Level of sustainability inclusion in scientific research in public universities
1 (14%)	1 (<i>not at all</i>)	4 (15%)
5 (72%)	2 (<i>little inclusion</i>)	4 (15%)
1 (14%)	3 (<i>average inclusion</i>)	14 (55%)
0 (0%)	4 (<i>good inclusion</i>)	4 (15%)
0 (0%)	5 (<i>very good inclusion</i>)	5 (0%)

Results of all respondents regarding inclusion of ES in current universities operations are in Table 5.

Table 5. Level of sustainability inclusion in operations. Source: data from questionnaires

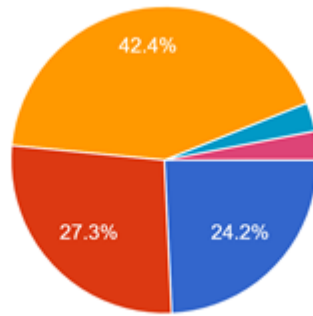
Level of ES inclusion in operations

Buildin g constru ction and renovat ion based on green design princip les	Energy conserv ation practice s (includi ng lighting , heating , cooling , ventilat ion, windo ws, etc.)	Waste reduction practices (such as e- communic ations, double- sided copying, “waste free lunch” program, etc.)	Recyc ling of solid waste (inclu ding paper, plasti c, metal, e- waste, etc.)	Water conserv ation practice s (includi ng efficient toilets, minimal irrigatio n, harveste d rainwat er, etc.)	Sustainable transportati on program (including bicycle/ped estrian friendly systems, car pools, bus pass programs, biodiesel projects, etc.)	Green purchasing from environme ntally and socially responsible companies (products are non- toxic, water and energy conserving, etc.)	Envir onme ntal or sustai nabili ty assess ments / audits	Average Operations Toward Sustainabili ty
2.8	2.7	2.3	1.85	2.2	2	2	1.9	2.22

Data related to HR training regarding ES can be found in Figure 4.

Figure 4. ES concept inclusion in HR training at Tirana universities

Nr/% of respondents	Level of inclusion
14 (42.4%)	3 average inclusion
9 (27.3%)	2 little inclusion



8 (24.2%)	1 no inclusion at all
0 (0%)	4 good inclusion
0 (0%)	5 very good inclusion

4.2 Inclusion of ES in Syllabuses

A detailed reading was performed on 122 syllabuses of various Tirana Universities including University of Tirana (60 syllabuses), Epoka University (58 syllabuses), Mediterranean University (3 syllabuses) and Logos University (1 syllabus). 44 programs contained at least one concept related to ES. Table 6 below, shows only university names, faculty, department, study program where the subject is offered and topics that the subject covers related to ES.

4.3 Results from Structured Interviews

As it came from structured interviews and research on public documents, Universities operating in Tirana are involved in ES with projects, strategies, as well as centers dedicated to promotion of sustainability. Such actual involvement can be traced as following in this section.

Table 6. Inclusion of ES in Syllabuses

University	Subject	Study program	Content related to environmental sustainability
University of Tirana	Public Administration	Master in Public administration	Social, political, economic and environmental aspects of administration in public sector. Human rights and accountability of public organizations related to Environmental Issues, public organization response to environmental problems, ethics in decision making related to environment, triple bottom line economic social and environmental perspective
Faculty of Economy	HR in Public Administration	Master in Public administration	Employee friendly policies
Department Management	European Public Administration	Master in Public administration	Economic, social and environmental Committee presentation and its role
	Strategic Management in Public Administration	Master in Public administration	Porter Analysis related to ecological factors
	Leadership in public organizations	Master in Public administration	Leadership in the social context, challenges of XXI century (including environmental ones)
	Managerial Skills	MBA and MSC in Bus Admin	Ethical skills related to Management Decision Making. Sustainability related to Environment is a concept studied in every chapter of this subject
	Managerial Planning and Control Systems	MBA and MSC in Bus Admin	Reporting on Social Responsibility
	Corporate Governance	MBA and MSC in Bus Admin	Corporation and social environment, the rights and obligations of corporations (including environmental responsibility), corporate reporting and social responsibility, preliminary considerations on social responsibility
	Managerial Decision Making	MBA and MSC in Bus Admin	Creativity and Ethics in Decision Making, environmental perspective included
	Business Management	Bachelor in Business Administration	Social responsibility of the business, evolution and views on social responsibility (social, economic and environmental point of view), green management, sustainable management practices
	Business Ethics	Bachelor in Bus Admin/ Business Informatics/ Finance/	Corporate Social Responsibility, commercial companies and their engagement with business ethics, reporting as part of corporate social responsibility
	Small Business Entrepreneurship	Bachelor in Bus Admin/ Business Informatics/ Finance	How social and ethical need businesses be in the global space (including environmental responsibility)
	Innovation Management	Bachelor in Bus Admin/ Business	Social entrepreneurship for environmental innovation, organizational culture and impact on environment (Google case study)
Department Economics	Managerial Economics	Master in BA, Master in Economics	Business, Government and environmental externalities (example air pollution)
	Environmental Economics	Master in BA, Master in Economics	Concepts of sustainability on environment, Efficient and optimal use of natural resources, economics and Environment
Department Finance	Approach to Climate Changes according to EU regulations	MSC in Risk Management Finance	Human aspects of climate changes, international collaboration for approaching climate changes, from environmental justice to climate justice approach, climate changes economics, political and economic aspects of climate changes in European Union
Department Marketing	Cultural and Environmental Heritage in Tourism	MSC/MProfessional in Marketing-Tourism	Cultural and Environmental Heritage in Tourism
EPOKA UNIVERSITY	Management and Organization	Bach in Bus Admin/ Business Informatics/ Finance	Corporate Responsibility, and Sustainability. The Natural Environment and Sustainability. Environmental Agendas for the Future. Corporate Social Responsibility, including environmental sustainability
Faculty of Economics and Adm. Sciences	Introduction to Business	Bach in Bus Admin/ Business Informatics/ Finance	Business Ethics and Social Responsibility, Explain the business responsibilities to the public including environmental ones
Department of Bus Admin	Marketing II (advanced)	Bachelor in Business Administration	Social and environmental marketing sustainability
	Total Quality Management	Bachelor in Business Administration	Learning and adopting the ethical, social and environmental responsibilities needed in the field of business administration and management.
	Innovation & Human Consciousness	Bachelor in Business Administration	Social entrepreneurship for environmental innovation
	Managerial Accounting	Bachelor in Business Administration	Corporate ethical, social and environmental responsibility in Managerial Accounting
	Strategic Logistic Management	Bachelor in Business Administration	Reverse Logistics and recycling. Circular economy and regulations. Product recovery options. Reverse logistics. Recycling. Sustainable logistics and supply chain management strategy. Environmental management systems
	Department of Economics	Environmental Politics	Bachelor in Economics
Natural Resources and Environmental Economics		Bachelor in Economics	Concepts of sustainability on environment, Economic and environmental ethics, Efficient and optimal use of natural resources, Pollution problems, Renewable sources

Department of Law	Environmental Law	Master in Law	Environment and basic principles of environment protection, basic introduction of rights and obligations of decision makers in the context of sustainable development
Faculty of Law and Social Sciences	Crisis Analysis and management	Bachelor in Economics	Environmental economics, agriculture economics
Department of political Science and International Relations	Government, Politics and Public Policy in Albania	Bachelor in Economics, Law and Social Sciences	Environmental and Energy Policy
Faculty of Architecture and Engineering	Building Construction Technology	Master in Architecture	Interaction of user environmental-building and introduction of environmental factors and expected performance
Department of Architecture	Urban Design I	Master in Architecture	Develop physical solutions through spatial interventions to deliver socially, economically and environmentally just places.
	Environmental Control	Master in Architecture	Climate and climatic elements, climatic comfort, design parameters related to built environment which are effective on climate and energy control, Design of built environment as energy efficient passive climatization system.
	Green Urbanism & Ecological	Master in Architecture	Sustainable city, The Components of Sustainable Urban Mobility, Sustainable mobility
	Nature Driven Urban Planning and Design	Master in Architecture	Ecosystem Services [ES] and Nature Based Solutions [NBS], NBS for Urban Challenges in the Era of Climate Change, Urban Green Infrastructure as a mean of NBS
	Directed Studies in Environmental Design	Master in Architecture	Definition of sustainability, Eco-materials, eco-building, energy efficiency, Life cycle assessment: Past-Present-Future. Toward sustainable solutions.
	Environmental Psychology	Master in Architecture	Introduction to Environmental Psychology, Behavioral Research in Environmental Design
	Building and Human Ecology	Master in Architecture	Energy, climate and design, Natural energy sources, renewable and clean energy,
	Sustainable Design and Technology Research Workshop	Master in Architecture	Sustainable Approaches in Urban and Building scale, Urban Ecology and Human Ecology
	Design with Climate	Master in Architecture	Energy, climate and design, Natural energy sources, renewable and clean energy,
	Urban Microclimate	Master in Architecture	Urban environment and Energy sustainability, Principles and criteria for assessing urban energy resilience
MEDITERRANEAN UNIVERSITY	Management	Bachelor in BA	Introduction of Sustainability including Environmental one
Faculty of Economic Sciences	Cultural and Environmental Heritage of Albania and Mediterranean	Bachelor in BA	Cultural and Environmental Heritage Introduction
Department of Bus Admin	Sustainable Development in Tourism	Master in Business Administration	Sustainable Development in Tourism, Environmental pollution Module
Logos University College, Faculty of economics, Dept Finance	Auditing	Bachelor and Scientific Master in Finance	Energy Consumption Auditing

Research Projects related to ES

Several projects are actually on go in the universities operating in Tirana related to ES. Namely,

Blue WBC ERASMUS+ Project gathers the capacities of Higher Education Institutions (HEIs) to improve Blue Economies in Montenegro and Albania, through better education in innovation and entrepreneurship. It aims at achieving sustainable development of Blue economies through higher education and innovation in Western Balkan countries^{xv}.

INTERBA ERASMUS+ Project aims to strengthen international, intercultural & global dimensions via Internalization at Home implementation at partner HEIs in order to enhance the quality of education and make a meaningful contribution to the society. WP6 focuses directly on sustainability.^{xvi}

SUSNANO – Horizon Europe ^{xvii}Twinning to boost the scientific and innovation capacity of the University of Tirana to develop sustainable nano sensors for water pollution detection. The project aims to conduct exploratory research on sustainable nano sensors and develop a portable device for quality assessment of freshwaters.

IPA II Cross Border Cooperation Programme Montenegro Albania 2014-2020. The global objective of this program is to promote good neighborly relations of border regions, through the assessment of their tourism potential, sustainable environmental development, respecting the common cultural and natural heritage.^{xviii}

INTERREG - Balkan MED Interregional Innovation Ecosystem for maturing and mainstreaming innovative entrepreneur in agri-food sector.^{xix}

Promoting CCA and DRM in the framework of EU Integration ERASMUS+ Jean Monnet Module. This project aims to develop Jean Monnet teaching modules addressing issues related to disaster management in the framework of European integration policies.^{xx}

SORENM-NASMRI Project. Preparation and Activation of the ilmenite Nanomaterial and Evaluation of the Efficacy of its use in cleaning lands polluted from heavy metals. The project's purpose is the development of innovative methods to improve the quality of lands polluted from heavy metals through the use of nanomaterials with an ilmenite base.^{xxi}

NASRI Project-Assessment of rare and endangered species of plants and invertebrates in their habitats in the areas of Korçë, Berat and Vlorë.^{xxii}

NASRI Project-Establishment of the Raman Spectroscopy Laboratory for the study of microplastics in sea and freshwater ecosystems.^{xxiii}

NASRI Project – Molecular characterization of bacterial communities of coastal saltwater lakes: advances techniques for the bio recovery of polluted waters. ^{xxiv}

NASRI Project – Monitoring toxic pollutants in the air of the environment of Tirana and Elbasan.

Erasmus+ KA2 Project Mainstreaming Environmental Communication through online Learning. The project will introduce an innovative and interdisciplinary approach to education on the internet related to environmental communication initiatives.^{xxv}

4.3.2 Interdisciplinary center related to ES

Yunus Center for Social Business and Sustainability (YCSBS at Epoka University) serves as a research center to map the social business ecosystem, gather knowledge on social business, examine and test theories of social business, while also seeking to find predictors of success in social business and its ultimate impact in reducing poverty and other social, economic, or environmental problems. YCSBS further works to disseminate knowledge on social business with academia, in the market, with government, and with civil society. Additionally, YCSBS educates students with the principles of social business and prepares them in accordance with market needs. By offering trainings and mentorships on how to build and develop social businesses, YCSBS equips various professionals and entrepreneurs with the needed social business principles to tackle these pressing social, economic, and environmental challenges.^{xxvi}

4.3.3 Strategy for Environmentally Friendly University 2022-2027” developed by the University of Tirana.^{xxvii}

With an extensive culture and history of interdisciplinary scientific research, University of Tirana (UT) can affect social change through educating and training regarding the importance of 17 Sustainable Development Goals of UN. The UT’s strategic goal is to be a leader in the country for the education and implementation of the principles of Sustainable Development. UT aims to lead by example by becoming the first institutional University in Albania to be qualified as "Green University". In fulfillment of these goals, the "Strategy for a Friendly University" was drawn up to protect the environment. This strategy contains a number of specific directions and respective plans, such as: management of energy and CO₂; sustainable construction and restoration of

friendly spaces and facilities with the environment; conservation of biodiversity and ecosystems, environmental management, management of waste; water management; mobility and sustainable transport; health insurance and well-being of staff, students and collaborators, ES in teaching and scientific research; as well as green procurement rules.

Analysis, discussion and future considerations

According to data gathered and presented in previous sections ES projected in different variables of this study is low to average.

Inclusion of ES concept in syllabuses according to the *questionnaire* conducted is 2.4, where second level represents little inclusion and third level represent average inclusion. These results are also sustained by the *qualitative reading of syllabuses*, where out of 122 syllabuses read, only 44 (38%) of them had at least one concept related to ES.

Only 16 (13%) of subjects are related to ES; 8 of them (7%) are business related courses. The rest are architecture, law or other courses. Most of the subjects lack a holistic and inclusive approach related to ES and more focus is put on economic and social sustainability. Some of the **subjects taught that are dedicated to sustainability** in Universities in Tirana are *Environmental Economics, Approach to Climate Changes according to EU regulations, Cultural and Environmental Heritage in Tourism, Environmental Politics, Natural Resources and Environmental Economics, Environmental Law, Cultural and Environmental Heritage of Albania and Mediterranean, Sustainable Development in Tourism*. These subjects are taught in public and non-public universities in Tirana.

It is important to highlight that in public Universities (offering education on business and economy), only 3 of the **courses** (out of 60 studied) are ES designed. The rest of the subjects have a sustainability related thematic, but focus of this concept in dedicated lectures is minimal. The ES concept is included in one or maximum two chapters of subjects' lectures.

From the quantitative data, came out that 14% of professors don't include ES knowledge in their respective fields of study and 80% have little to moderate inclusion of the concepts in their subjects, and only 6% of them have good coverage of these concepts in their syllables.

A comparison of USA/Canada Business Schools syllabuses with those of Universities in Tirana showed a gap regarding ES. Georgia University, Darden School of Business in Virginia, Ross School of Business in Michigan and McGill School of Canada (taken in consideration) have

dedicated subjects related to ES in their business-related programs, beginning from bachelor programs. Universities in Tirana have much less **dedicated study programs to ES** (only 8 programs), and most of them are at master's level.

ES inclusion in current scientific research according to data gathered through the questionnaire is 2.55, which represents the highest results in four variables measured with the questionnaire (syllabuses, scientific research, operations and training related to ES). Public universities score a higher level of involvement in **projects related to ES**. Some of the most important projects in this field with the highest budgets are Blue WBC, INTERBA, SUSNANO, INTERREG all funded from EU. There are also some local projects funded from Albanian sources.

Level of **ES inclusion in operations** is 2.22, the lowest level being 'Recycling of solid waste' 1.8 and highest level being 'Building construction and renovation based on green design principles' 2.8. It is worth mentioning that Faculty of Economy, University of Tirana was renovated in 2021 following the principles of ES.

The lowest scoring level of variables related to sustainability is "ES concept inclusion in HR training of universities operating in Tirana" with a score as low as 2.06.

To wrap up, we can say that the current level of ES in syllabuses, in scientific research, in operations and HR trainings and practices in university staff is not sufficient in universities operating in Tirana.

The role of universities as important actors to establish a general culture and diffuse these concepts to their students is of imperative value, since students will become future actors in organizations and businesses. More information, skills, knowledge on ES is given today, better sustainable business practices we will have in the future.

Time has come for sustainable and long run solutions. Different strategies can be followed to achieve this.

First, there is a strong need for periodically revisiting the syllabuses of business administration, finance, and accounting programs. As society's concern rises, the concepts related to environmental, social and ES can be part of every subject syllabus. Additionally, some specific subjects related only to sustainability can be added to bachelor and master level study programs.

Second, more engagement is needed in scientific research perspective. More projects related to sustainability, as well as investment from government on multidisciplinary centers dedicated to sustainability can be a catalysator to boost research in ES.

Third, university management needs to develop regulations that support ES. A gradual introduction of green campuses, green university buildings, recycling of materials, alternative ways of teaching (online activities), better managing of wastes, climate awareness programs, eco-efficiency practices, alternative ways of transportation, etc., are some of the initiatives that universities can follow.

Fourth, universities are a good place for trainings, workshops, seminars, thematic competitions, etc., related to ES by engaging their qualified staff and students.

Fifth, a close collaboration of universities with businesses that apply the ES concepts in their daily activities, as well as internships of students in these, is a good way to go. The know-how transfer will be easier and more effective by a closed collaboration of universities and business.

Sixth, time has come that universities in Albania write their own strategy and action plans to better implement sustainability in their activities.

Although the analysis followed different perspectives of being environmentally sustainable, it has some limitations. Sources limitation-due to limitations of time and respondents the study was performed only on some universities operating in Tirana, mostly on those offering study programs in economics and business. As there are also universities offering education in medicine, engineering, earth sciences, agronomy, architecture, law, sports, arts, etc., the conclusions of the study are partial, and only can help as a teaser for a future study with a broader and more representative sample.

The survey was conducted based on answers from only those professors who wanted to participate, by making the sample not necessarily representative. Moreover, the aimed reading of syllabuses was conducted only for available/accessible syllabuses by so lowering the generalization of the findings.

However, the validity of instruments and approach, guarantees that it can be followed and replicated by broadening the number and variety of respondents and universities.

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