International Labour Organization

FINANCE THINK OUT OF THE BOX

GRANULAR EXAMINATION OF THE INFORMAL ECONOMY IN NORTH MACEDONIA

INSIGHTS INTO INFORMAL WORKERS, UNDECLARED WORK AND INCOME UNDERREPORTING IN HOUSEHOLDS

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GRANULAR EXAMINATION OF THE INFORMAL ECONOMY IN NORTH MACEDONIA

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1 Introduction

The informal sector constitutes a large share of developing countries' economic activity. The informal production may reach up to two-thirds of the gross domestic product of developing countries and the share of informal employment and informal firms may be as high as 80 per cent of the labour force and business sector, respectively (Schneider and Enste 2000; Ulyssea 2018). The different measurements of informal activity arise from the elusive definition of informal economy as the concept is not strictly related to the firms that fail to register to avoid regulatory standards, but also to the tendency of formal firms to underreport revenues and hire workers to avoid the costs of tax and labour regulations. Thus, the behavior results in complete or partial noncompliance with tax and labour regulations. The understanding of the extent and complexity of the informal economy is important for many reasons: 1) the reduced tax collections stimulate further tax noncompliant behavior and reduced quality of public services; 2) the tax noncompliance affects the decisions of workers and firms for working and investments; 3) the large extent of noncompliance requires resources and investments in enforcement capacities to mitigate noncompliant behavior; 4) its effects on income distribution are unpredictable, 5) it affects the accuracy of macroeconomic statistics which may lead to poor policymaking[1], and 6) informal and undeclared work renders workers without any or insufficient protection and rights guaranteed by international labour standards and national legislation.

The government of North Macedonia is striving to reduce the informal economy by devising various strategic and action plans. The Ministry of Finance recently prepared the Strategy for Formalization of the Informal Economy 2023-2027, which succeeded the edition 2018-2022. However, not much has been accomplished with respect to the latter as it existed as a pan-institutional strategy with no real institutional owner. The reduction of informality is also a part of the Public Revenue Office's Strategic Plan 2023-2025 and the Ministry of Finance's Strategy for Tax System Reforms 2021-2025. The recent evidence shows that the informal production constitutes between 21,3 percent and 33,6 percent of the Macedonian Gross Domestic Product with important decreasing tendencies during the last decade (Elgin et al. 2021; Finance Think 2021; Trenovski et al. 2021; Trpeski et al. 2023). In particular, the shift towards a flat tax regime in 2008 and the introduction of a minimum wage in 2012 significantly contributed to shrinking informality in the Macedonian economy (Finance Think,

[1]See, Alm (2019).

2021). Researchers used various indirect methods to estimate the size of the informal economy in North Macedonia, such as the multiple indicators multiple causes model (MIMIC) (Elgin et al. 2021; Garvanlieva Andonova, Andonov and Nikolov 2012; Kelmanson et al. 2019; Schneider, Buehn, and Montenegro 2010; Trenovski et al. 2021) ; the dynamic general equilibrium model (DGE) (Elgin and Oztunali 2012; Elgin et al. 2021); electricity consumption method (Garvanlieva Andonova, Andonov and Nikolov 2012; Trenovski et al. 2021; Trpeski et al., 2023); and currency demand method (Finance Think 2021). While these methods provide valuable estimates of the informal economy, they do not provide a granular picture of the informal economy which might be more relevant for policymakers in devising appropriate policy measures.

The aim of this study is to dissect as comprehensively as possible and quantify the dimensions of the informal economy in North Macedonia, focusing specifically on informal workers, undeclared work and income underreporting in households. To achieve this objective, we employ a multifaceted methodology that harnesses the power of two distinct data sources. Firstly, we utilize the Labour Force Survey 2022 in conjunction with structural business statistics from the State Statistical Office of North Macedonia to implement the Labour Input Method (LIM). This method allows us to scrutinize the discrepancy between reported labour supply and labour demand, enabling an estimation of the undeclared work. We also use LFS to portray informal workers who could be identified from the questionnaire. Secondly, we leverage the Survey of Income and Living Conditions (SILC) 2018 for North Macedonia to execute a consumption-based approach, offering insights into the variation of income underreporting within households. Through this dual-pronged methodology, we aim to provide a nuanced understanding of the informal economy, shedding light on its prevalence and impact within the Macedonian context.

This study makes substantial contributions in two domains. Firstly, it marks the pioneering effort in North Macedonia to offer a detailed, granular examination of the informal economy. By focusing on informal workers, undeclared work and income underreporting in households, this research diverges from prior studies that predominantly relied on aggregate and indirect methodologies, often resulting in singular, overarching statistics on the size of the informal economy. In contrast, our study delves deeper into these multifaceted dimensions, providing a nuanced understanding of their prevalence within the Macedonian context. Secondly, the implications of this research extend significantly to policymaking. By identifying sectors and entities more susceptible to undeclared work, our findings offer insights that may help policymakers and inspectorates gear their actions and, henceforth, resource usage towards the spots that will result in large societal rewards. Furthermore, the statistics on income underreporting in households shed light on specific household income types prone to underreporting, along with the extent of

such discrepancies across various household groups. These insights equip policymakers with crucial information to devise targeted strategies, fostering more effective policies aimed at curbing income underreporting, thus securing budget revenues at the internal margin before new taxes are introduced or existing ones are changed.

This study proceeds as follows: In the next section we review the existing literature on informality of firms and workers and drivers of informality. Then we present the data sources, followed by a snapshot of the characteristics of informal workers. This is then followed by a development of methodologies to measure two crucial aspects of informality: undeclared labour and income underreporting in households, and a section containing the estimates of these two aspects. The final section concludes and provides policy recommendations.

2 Literature review: Informality of firms and workers

Empirical research about informal economy measurement expanded in the last few decades with the greater availability of data and researchers' creativity to measure the invisible. The difficulties in measuring the informal economy primarily arise from the lack of clarity about what constitutes an informal economy. Schneider (2005) provides a widely accepted definition of informal economy as all market-based legal production of goods and services that are deliberately hidden from public authorities to avoid (1) payment of taxes or social security contributions, (2) meeting labour market standards, or (3) complying with certain administrative procedures. The indirect approach of measurement provides insights about the size and may be more suitable for measuring the informal economy as defined in Schneider (2005). However, it is less relevant to policymakers as it does not provide a granular picture of the informal economy.[2] On the other side, the direct approach may not provide complete coverage of the invisible because it relies on micro-data (from surveys or tax audits), but it may shed light on different aspects of the informal economy through characterizing informal firms, formal firms pursuing informalities in their work, and workers (Ulyssea 2020).

As the aim of this study is to provide policy relevant analysis of the informal economy by examining various survey data, we rely on Ulyssea's (2018; 2020) aspects of the informal economy. As formal firms may underreport revenues and hire workers to avoid the costs of tax and labour regulations, Ulyssea (2018) differentiates between two margins of informality: (1) the extensive margin refers to the informal firm inclination to formalize, while (2) the intensive margin refers to the formal firm inclination to hire workers without a formal contract and/or to evade taxes by underreporting turnover and/or profits. Obviously, the informal economy driven by nonregistered businesses is difficult to be captured by using tax or survey data because the business's activities may not trigger tax liability or may not be reported in the surveys (Slemrod and Weber 2012).

[2] Researchers use an indirect approach to measure the informal economy through developing various models with aggregate variables to exploit the variation in the chosen variables (e.g., Loayza 1996, Schneider and Enste 2000).

Moreover, in countries like North Macedonia, this part is even considered to be small (Petreski and Petreski 2022). Thus, our analysis largely refers to the more nuanced intensive margin of informality and tax noncompliance. Before proceeding to the main analysis, we review the main factors driving firms and workers to act informally.

What drives the informality of firms?

Excessive taxes and regulations - Regulations and tax systems that are restrictive and complex boost informal activity in economies (Schneider and Enste 2000). According to Fortin, Marceau and Savard (1997), rising payroll taxes, profit taxes, and registration/licensing fees encourage firms to go informal. Furthermore, Auriol and Warlters (2005) claim that in poorer nations, fixed costs of formalization (registration fees) are greater than in richer nations, keeping small and poor entrepreneurs out of the formal sector. Similarly, Ulyssea (2010) finds that lower entrance costs into the formal sector boost formal employment, but Rocha et al. (2018) show that lower tax rates increase the number of formal firms.

Poor regulatory framework and enforcement - Aside from the legal and regulatory framework, poor law and regulatory enforcement raises the expenses of doing business in the formal sector, encouraging firms to stay informal. According to Johnson, Kaufmann and Zoido-Lobatón (1998) and Friedman et al. (2000), while firms are prepared to comply with current laws and regulations, they prefer to avoid arbitrary and bureaucratic demands and corruptive behavior by remaining informal. Also, Dabla-Norris, Gradstein and Inchauste (2008) argue that regulatory burden may increase informality, but the stronger the rule of law, the weaker the effect on boosting informality. Finally, Loayza (1996) and Djankov et al. (2002) argue that restrictive tax and regulatory systems are accompanied by a lack of enforcement capabilities or increased levels of corruption, which promotes the informal economy.

Firms would be pushed to formalize if the costs of remaining informal increased, especially if enforcement becomes tighter. The labour market frictions and low-productivity firms are the reasons why stronger rules and inspections may diminish the growth of the informal sector. According to Meghir, Narita, and Robin (2015), search frictions allow firms to be profitable by posting positions in both the formal and informal sectors while accounting for compliance costs (fines if detected). Thus, search frictions enable low-productivity firms to stay informal and profitable, whereas improved regulatory enforcement would result in improved labour allocation to higher-productivity positions. Additionally, stricter enforcement would drive low productivity firms out of the market and improve resource allocation in the economy (Ordóez 2014; Ulyssea 2018).

In a more nuanced way, formal firms may decide to avoid or evade taxes. According to the standard deterrence framework, businesses weigh the benefits and costs of evasion which largely depend on the probability of being detected by the authorities (Allingham and Sandmo, 1972; Becker 1968). Tax noncompliance may arise not only from poor enforcement, but also due to other behavioral motives as a response to the enforcement authority's behavior. [3] However, due to the multiple obligations which firms have, the informality may encapsulate tax compliant as well as tax noncompliant behavior. For this reason, recognizing the varieties of informality is of utmost importance in devising proper policy measures for tackling informality driven by tax noncompliant or by tax compliant behavior (Kanbur and Keen, (2014). For instance, some firms may not comply with safety and labour regulations, but also, they may not have tax obligations due to the lower taxable income.

Limited access to public goods and services - Firms remain in the informal sector due to restricted access to official means of contract enforcement and capital markets. Quintin (2008), for example, emphasizes the role of contract enforcement in relieving formal organizations' borrowing limits, allowing them to develop and be successful. Similarly, related research demonstrates that increasing formal sector loan availability reduces the size of the informal sector (Lopez-Martin, 2019). [4]

Information frictions - Informal businesses may be unaware of the registration procedures and fees, as well as the benefits of going formal. According to De Giorgi and Rahman (2013), awareness campaigns enhanced informal firms' knowledge of registration procedures but did not increase business registration. In contrast, Benhassine et al. (2018) discover that providing information about the potential benefits of formalization, business training, and support for starting a business, as well as tax mediation services, encourages informal firms to become formal, but the formal firms do not benefit significantly in terms of increased loans, sales, or profits.

Low tax morale – Low tax morale of entrepreneurs and population, which is caused by poor institutional systems (Littlewood, Rogers and Williams 2020; Williams and Bezeredi 2018), results in a high tolerance of informality. According to Williams and Bezeredi (2018), the more the perceived governmental corruption, the lower the tax morale and the higher the acceptability of small entrepreneurs' informality. While increasing the likelihood of detection may increase the population's sense of moral and social obligation (Andrade, Bruhn, and McKenzie 2016), forcing compliance with excessive and inefficient regulation may result in higher unemployment, resulting in a higher tolerance for informality (Ulyssea 2010).

[3] See, Slemrod (2019).

[4] More about the role of financial constraints in driving informal activity, see Straub (2005), Catão, Pages and Rosales (2009), De Paula and Scheinkman (2011) and Mel, McKenzie, and Woodruff.(2013).

What drives the informality of workers?

Poor enforcement of labour regulations – Informal employment resides within formal and informal firms. Frequent labour inspections generally increase the costs of informal employment, pushing undeclared or underdeclared workers into the fully formal sector. Almeida and Carneiro (2012) show that the rise in labour inspections stimulates formal employment and discourages informal employment. The increasing attractiveness of formal employment arises from the increasing compliance with mandated benefits, which are highly valued by workers, driven by the stronger enforcement of labour regulations. Additionally, in the presence of wage rigidities (such as high levels of minimum wages), formal sector jobs become more attractive to informal workers because the wage adjustments are bounded from below.

Trade shocks – The changes in trade policies may cause ins and outs of informality. The general notion is that trade policies may distort the demand in the formal and informal sectors causing employment movements from the formal to the informal sector or vice versa. For instance, the extant literature finds that tariff reductions instigated increases in informal employment (Cruces, Porto and Viollaz 2018; Dix-Carneiro and Kovak 2019; Paz 2014). On the other side, the liberalization of trade may trigger reallocation of workers from informal to formal firms (e.g., McCaig and Pavcnik, 2018).

Generous welfare policies – Universal health insurance, generous social security and unemployment insurance systems may reduce the attractiveness of formal jobs and discourage work in the formal sector. For instance, Bosch and Campos-Vasquez (2014) find that the creation of universal health coverage program in Mexico had negative effects on formality in small and medium firms. In addition, Bergolo and Cruces (2021) and Garganta and Gasparini (2015) find that cash transfer programs in Uruguay and Argentina, respectively, had significant negative impact on formal employment. Finally, generous unemployment insurance programs may stimulate the insurance-covered unemployed to accumulate the benefits with nontaxed earnings from informal employment (Gerard and Gonzaga, 2021). However, the relationship between unemployment insurance and informal employment is more complex and depends on program design (Bosch and Esteban-Pretel, 2015).

Institutional incongruence – Williams, Horodnic, and Windebank (2015) argue that participation in the informal economy arises from the lack of alignment of a society's formal institutions (i.e., its codified laws and regulations) with its informal institutions (i.e., the norms, values, and beliefs of its population). This institutional asymmetry materializes via lower tax morale which results in more prevalent illegitimate wage practices. Thus, employees with lower tax morale are more likely to collude with employers towards salary under-reporting (Williams and Horodnic, 2017). Williams and Horodnic (2015a; 2015b) find that the asymmetry between formal and informal institutions leads to a higher propensity of paying envelope wages in the Baltic Sea and Southern Europe regions.

3 Data

Data on the informal economy does not exist, simply because the phenomenon under consideration is unobserved. However, with the methodologies that we are pursuing in this paper, granular aspects of the informal economy could be estimated. To employ these methodologies, we rely on a few existing sources of data. The first is the Labour Force Survey (LFS 2022) from the State Statistical Office of North Macedonia. LFS provides a comprehensive dataset of labour supplied by individuals, including but not limited to the employment status (such as employee, self-employed, or unpaid family worker), hours worked, secondary job engagements, and an array of socio-economic characteristics of respondents. It is critical to note, however, that LFS asks individuals if they were registered with the Pension Fund, Health Fund and/or the Public Revenue Office, which would constitute a formal work arrangement, as well as if the firm in which they work has been registered with the Central Registry, which signifies a formalized business. Hence, we offer some stylized facts based on these questions from the LFS in the next section before we proceed with a deeper examination of the informal economy.

The second source we use, in conjunction with the LFS, is the structural business statistics (SBS) for 2022, also from the State Statistical Office. As opposed to LFS, SBS primarily captures labour demand by firms, typically presenting employment information in terms of jobs. SBS calculations provide indicators for the turnover, added value, gross business surplus, etc., based on the bookkeeping records of business entities. Hence, this source is administrative.

The third source of data used in this study is the Survey on Income and Living Conditions (SILC 2018). This source involves structured interviews comprising a household questionnaire and an individual questionnaire administered to household members aged sixteen and above. The household questionnaire captures details about a household's composition, accommodation, housing costs, savings, debts, disposable and gross income. On the other hand, the individual questionnaire covers individual incomes categorized by source, along with other pertinent information like education, health, and occupation. Our self-reported income sources encompass employment, self-employment, pensions, unemployment or disability benefits, rental income from properties, and various capital income sources.

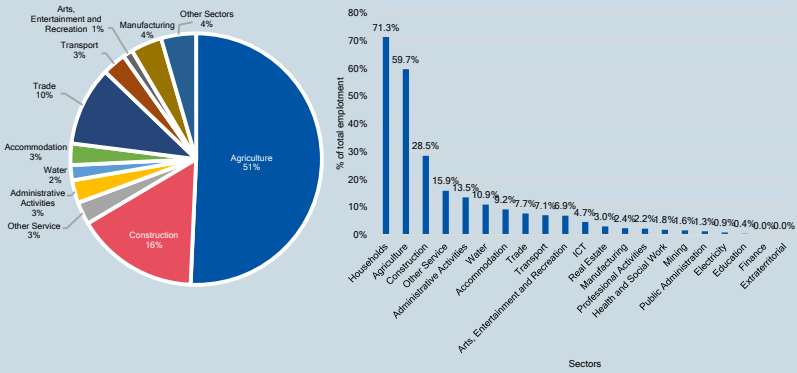
4 Stylized facts on informal workers

Before we delve deeper into the world of undeclared work, we portray informal workers in the manner they identified themselves in the LFS. It is important to mention that informal workers are not equal to undeclared workers because the latter may refer to activities of formally employed workers which occur below the radar of authorities, like payment of 'envelope wages' or working non-registered hours for free or for informal payment. LFS contains three questions that could identify informal workers: 1) if the worker has been registered with any relevant government institution like the Pension and Health Finds and the Public Revenue Office; 2) if the firm in which the worker is employed has been registered with any relevant government institution, like the Central Registry; and 3) if the concluded contract is written or oral. The latter has not been provided by SSO. We rely on the first two, hence capturing workers who are informal within registered firms and workers who work in non-registered firms. By so doing, in 2022 the size of informal workers in North Macedonia has been estimated at 11.8 per cent, down from 28.6 per cent in 2008 (data from MAK-STAT, aggregated statistics based on LFS, various years). The decline has been gradual. The pandemic year of 2020 is an exception: the informal employment declined to 13.6 per cent from 16.1 per cent in 2019, as many workers and their employers opted for formalization as a way to qualify for the job-saving measures of the government.

Half of the mass of informal workers is nested in agriculture, followed by construction and trade, altogether constituting more than three quarters of informal workers in North Macedonia (Figure 1, left). However, as a share within the sector employment, it is households who nest the largest informal work share, 71.3 per cent, followed by agriculture and construction (Figure 1, right).

Figure 1.

Informal workers by sector (left) and within sector (right)

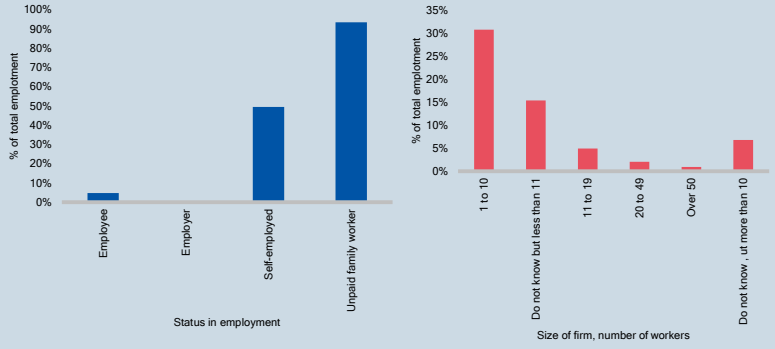


Authors' calculations based on LFS 2022.

Indeed, informal work is dominant among the unpaid family workers, of whom 93.5 per cent are informal (Figure 2, left). Close to 60 per cent of them work in agriculture. Half of the own-account workers are likewise informal. Most of the informal workers are concentrated in small firms, employing up to 10 workers (Figure 2, right). 30.8 per cent of workers in firms with fewer than 10 employees state they are informal, which is corroborated by the finding that informality rate is second-ranked, at 15.4 per cent, among those who did not know the number of workers in their employer but knew it was lower than 11.

Figure 2.

Informal workers by status in employment and size of firm

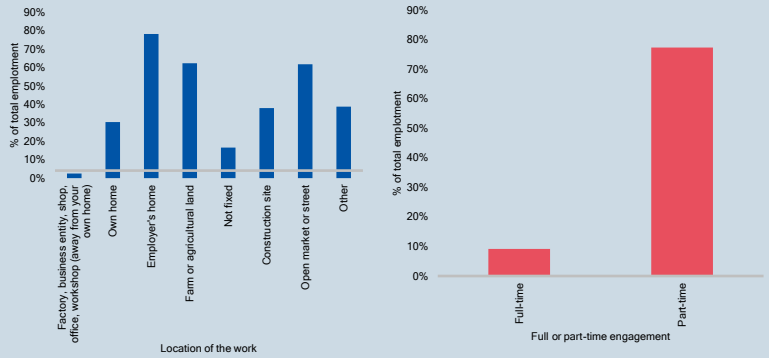


Authors' calculations based on LFS 2022.

Informal workers most frequently work part-time, as more than three quarters of part-timers reported informality (Figure 3, left). When observed based on the place where the work is performed, the prevalence of informality in households, agriculture, construction and trade is apparent (Figure 3, right): nearly 80 per cent of those engaged in an employer's home are informal, followed by about 60 per cent of those working on farms and selling on the streets. This implies that part-time work is likely occurring in specific locations and type of work.

Figure 3.

Informal workers by type of engagement and location of the work

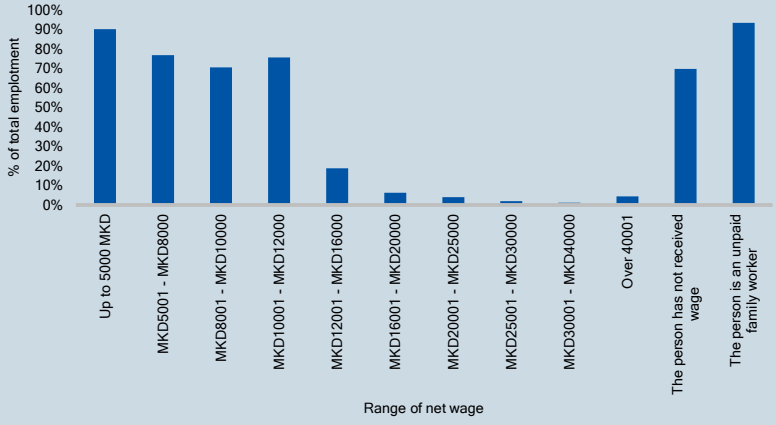


Authors' calculations based on LFS 2022.

Clearly, informal workers are usually paid below the statutory minimum wage, which in 2022 has been MKD18,000. This explains why in the wage distribution we see wages below this level. Most of the informal workers fall on the left of the wage spectrum (Figure 4).

Figure 4.

Informal workers by the amount of the received net wage

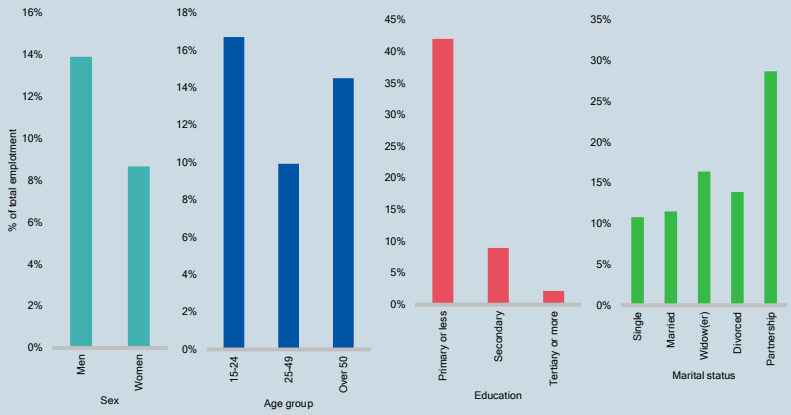


Authors' calculations based on LFS 2022.

Finally, Figure 5 observes the informality rates among workers based on four of their observable characteristics: sex, age, education and marital status. Informality is more frequently associated with men, either during their youth or among elderly adults, predominantly with primary education or less and among those living in unregistered partnership.

Figure 5.

Informal workers by observable workers' characteristics



Source: Authors' calculations based on LFS 2022.

Overall, informal workers in North Macedonia are usually nested in agriculture, construction and trade, working in small firms as own-account workers or unpaid family workers and receiving a salary usually below the statutory minimum wage. They are more frequently uneducated men than women of any kind.

5 Methodology

This study aims at deeper understanding of the informal economy in North Macedonia. To achieve this, we employ distinct methodologies to analyze two key facets comprehensively: undeclared work and income underreporting in households. For the evaluation of undeclared work, we adopt the Labour Input Method (LIM), an indirect approach that gauges the extent of undeclared work (UDW) by contrasting the reported labour supply from workers (as documented in the Labour Force Surveys, LFS) with the reported utilization of labour by employers (as recorded in structural business statistics, SBS). This method allows us to measure the variance between these data sources, revealing the scope of undeclared work in the country. Concurrently, our analysis of income underreporting within households involves a consumption-based methodology initially pioneered by Pissarides and Weber (1989). To adapt and refine this approach to our context, we draw from Feldman and Slemrod (2007), crafting a more comprehensive model where the total household income is constructed from multiple contributing components. This tailored approach enables a nuanced understanding of income underreporting within Macedonian households.

Estimation strategy: Undeclared work

In estimating undeclared work in North Macedonia, our methodology draws from Williams et al. (2017), adopting the Labour Input Method (LIM). This approach examines the difference between reported labour supply and labour demand to uncover the concealed aspects of the economy. Specifically, the undeclared work encapsulates two primary sources. Firstly, it encompasses hidden and underground activities that, while not inherently illegal, remain unreported to evade official scrutiny. Secondly, it encompasses “informal” activities, often cash-based transactions where service providers to households or individuals operate without maintaining formal business records. It is important to note that this concept excludes illegal economic activities such as drug dealing, prostitution, and black-market trades. The foundation of this approach lies in the notion that firms might deliberately hide segments of their economic activities, including labour inputs in the production of goods and services. By pinpointing disparities between labour inputs reported in enterprise surveys by businesses and those reported by individuals, this method

enables us to generate an estimate quantifying the extent of undeclared work within the country.

To estimate the undeclared work, we follow the LIM's systematic procedure. Firstly, we estimate labour input from structural business statistics, offering a comprehensive view of labour utilization within enterprises. Next, we estimate labour input based on household survey data obtained from the Labour Force Survey (LFS), capturing individual-reported labour supply.[5] Concurrently, we standardize these estimates, ensuring uniformity in labour input units, whether in hours worked or full-time equivalent employment units. Subsequently, we compare the two sets of estimates, diligently considering potential discrepancies while factoring in the reliability of distinct data sources. Further refinement comes through obtaining disaggregated estimates of labour supply at the economic activity and enterprise-size levels. We acquire estimates of value added per unit of labour input for corresponding activity and size breakdowns from standard structural business statistics. Finally, we multiply the labour input estimates by ratios expressed in per unit terms, generating the value added for activity and size categories. This process enables the calculation of the undeclared component of gross value added, offering valuable insights into the scope of undeclared work in North Macedonia.

We draw data from two distinct sources crucial in assessing the dynamics of undeclared work: the North Macedonia's Labour Force Survey (LFS) and structural business statistics (SBS) for 2022 from the State Statistical Office of North Macedonia. The LFS provides a comprehensive view of labour supplied by individuals, furnishing detailed insights into employment status (such as employee, self-employed, or unpaid family worker), hours worked, secondary job engagements, and an array of socio-economic characteristics of respondents. Conversely, SBS primarily captures labour demand by firms, typically presenting employment information in terms of jobs. It is important to note that in business surveys, an individual might be counted multiple times if engaged with multiple employers, leading to non-direct comparability with household survey data. To facilitate comparison, data from both sources are converted into uniform units, such as total hours worked or full-time equivalent employment. Following this conversion, if labour input reported from the supply side (LFS) exceeds that reported as utilized by employers (SBS), even after ensuring data comparability, the resultant difference signifies the extent of undeclared work within the economy.

[5] In estimating labour supply, we apply the weights from North Macedonia's LFS 2022.

The implementation of the Labour Input Method (LIM) necessitates several critical assumptions and adjustments. The method relies on the assumption that labour force surveys present an accurate reflection of the labour market's actual state within a country. Central to the LIM is the data from the LFS regarding the number of hours worked by individuals regularly, which is converted into yearly equivalents. This conversion process involves adjusting for inherent variations among individuals concerning their work input, dependent on factors such as economic sector, employment type, contract nature, and job nature. This LFS data enables the calculation of average hours worked per job, extrapolated to the entire working population based on assigned weights. However, challenges arise from disparities between the LFS, covering all industries, and structural business statistics (SBS), exclusively encompassing the private sector.[6] Some of the sectors were excluded due to discrepancies and data unavailability. Despite this, the comparable labour inputs, standardized into yearly hours worked (with an assumption of full-time engagement involving 40 weekly hours), enable the computation of discrepancies between labour supply from LFS and labour demand from SBS. These disparities are then used to compute the proportion of gross value added (GVA) attributed to undeclared work, delineating the scale of undeclared work in terms of hours worked and its share of GVA across various sectors and entity sizes.

Estimation strategy: Income underreporting

In estimating household income underreporting, our methodology aligns with Albarea et al. (2019)'s consumption-based approach, focusing on income misreporting within surveys. Central to this approach is the utilization of the Engel curve for certain goods, leveraging differences in income elasticity to unveil disparities in income misreporting tendencies among different income categories. This methodology traces its roots to the pioneering work of Pissarides and Weber (1989), initially exploring misreporting among the self-employed and assuming a uniform degree of misreporting across their entire income. However, advancing this concept, Feldman and Slemrod (2007) introduced a multifaceted model accounting for diverse income sources within households. Their model acknowledges the potential for varied misreporting

[6] Moreover, within the LFS (Question 26), respondents are queried about the size of the entity they work for, specifically whether they are employed in an entity with more than 10 employees. For alignment with the entity size classifications in SBS, assumptions are required for respondents who indicated employment in entities with more than 10 employees. This involves a reclassification process considering the probability of working in particular entity sizes based on both the sector and regional disparities exhibited by the respondents.

across different income sources, suggesting that households may misreport incomes from various sources in different proportions.[7] Additionally, it assumes that a particular income source is misreported uniformly across all households. This refined model delves deeper into the nuances of income misreporting, capturing variations in misreporting tendencies across distinct income sources within households. Following these studies, we specify the following log-linear Engel curve for a consumption of good C:

$$lnC_i = \beta_0 + \beta_1 lny_i^T + X_i\beta_2 + \varepsilon_i \quad (1)$$

where i stands for the i-th household, y^T_i is the true household income, β_1 is the income elasticity, X_i is the matrix of vectors with household characteristics that affect the consumption decision, and ε_i is an error term which may include transitory effects of current income with respect to permanent income. As in Feldman and Slemrod (2007), we define that total household income is constituted of several components:

$$y_i^T = \sum_j y_{ij}^T \quad (2)$$

where y^T_{ij} is the component of source j for household i. Under the assumption that a given income source is misreported in the same proportion by all taxpayers, we could specify the following relationship:

$$y_{ij}^T = \bar{k}_j y_{ij}^R \quad (3)$$

where k_j denote an adjustment factor that measures the extent of misreporting by any household i on income source j, assuming $k_j \neq 1$, while y^R_{ij} is the income reported in a survey by household i from source j. If $k_j > 1$, it is an evidence of income underreporting. By combining (2) and (3) in (1), we obtain:

$$lnC_i = \beta_0 + \beta_1 ln\left[\sum_j \bar{k}_j y_{ij}^R\right] + X_i\beta_2 + \varepsilon_i \quad (4)$$

[7] The primary distinction between wages and salaries, and income sources with significant noncompliance (like self-employment income), lies in the fact that wages and salaries are subjected to information reporting and withholding, whereas the latter typically are not. Noncompliance becomes more prevalent when income is self-reported, making it easier to conceal, in contrast to situations involving a second party, such as an employer, besides the taxpayer (Feldman and Slemrod, 2007).

The method relies on assuming that a particular income source is accurately reported (k_1=1). By using nonlinear least squares, we could estimate the adjustment factors from which we could derive the misreporting rates for source *j*, by:

$$\bar{u}_j = 1 - \frac{1}{k_j} \quad (5)$$

We utilize data from the SILC 2018 cross-sectional wave in North Macedonia to estimate income underreporting in households. For this analysis, we rely on the income sources reported by the individuals in SILC. However, the household portion of SILC 2018 lacks information on household food expenditures, usually a crucial variable in income-misreporting studies. Thus, we use an aggregate of home-related expenses, including heating, electricity, gas, and other fuel costs, as a dependent variable. Our focus lies in estimating potential misreporting across three primary income categories: 1) income from employment, 2) self-employment, and 3) rental income from immovable properties and other capital income, using pensions and specific state benefits as our main reference income category for analysis.

6 Empirical results

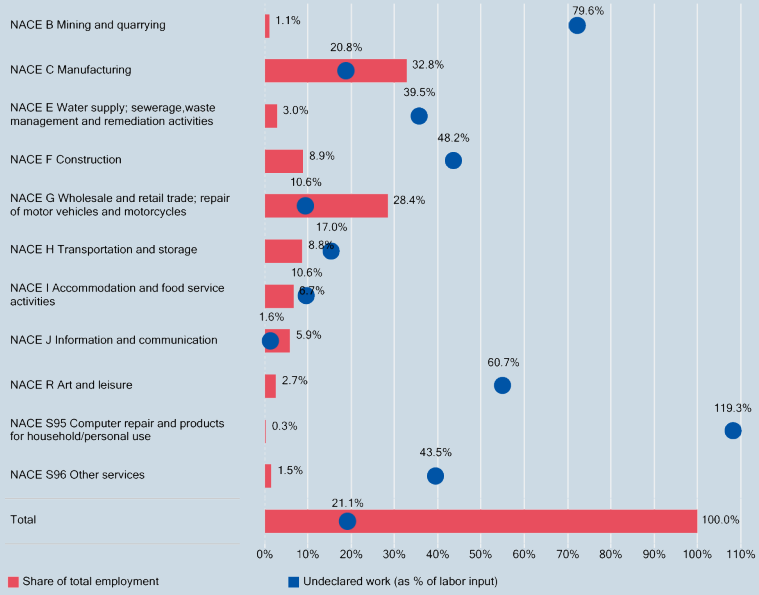
Estimates of undeclared work in North Macedonia

We estimate the discrepancy between labour supply and labour demand in terms of yearly hours worked by sector. We exclude the sectors which cannot be matched due to differences in LFS and SBS categorization.[8] Thus, we capture approximately 81 per cent of the workforce in North Macedonia as reported in the SBS. Figure 6 presents the estimates of undeclared work in the sectors in North Macedonia. The results show that 21.1 per cent of total labour input in North Macedonia is undeclared. This result is driven largely by the manufacturing sector which constitutes the largest share of our sample in terms of share in employment. We observe the largest discrepancies in sector NACE C – Mining and quarrying and NACE S95 - Repair of computers and personal and household goods, 79.6 percent and 119.3 percent, respectively. However, despite the large percentages, the contribution of these sectors to the total undeclared work is very limited due to their small size (only 1.37 percent of the sample labour force). Additionally, the third largest sector in terms of share in employment, NACE F – Construction has a significant 48.2 percent of undeclared labour input, while NACE J - Information and communication has only 1.6 percent.

[8] Since SBS includes only private sector, we exclude the public sectors or sectors with public sector components. The excluded sectors are NACE D - Electricity, gas, steam and air conditioning supply; NACE M - Professional, scientific, and technical activities; NACE N - Administrative and support service activities; NACE O - Public administration and defense; compulsory social security; NACE P – Education; NACE Q - Human health and social work activities. Additionally, SBS do not provide data for the following sectors: NACE A - Agriculture, forestry and fishing; NACE K - Financial and insurance activities; NACE S94 - Activities of membership organizations; NACE T - Activities of households as employers; undifferentiated goods - and services - producing activities of households for own use; NACE U - Activities of extraterritorial organizations and bodies. Finally, we exclude NACE L - Real estate activities due to abnormal negative discrepancies which might be attributed to a measurement error.

Figure 6.

Undeclared work as a % of the labour input (by sector)



Authors' calculations based on LFS/SBS 2022 from State Statistical Office of North Macedonia

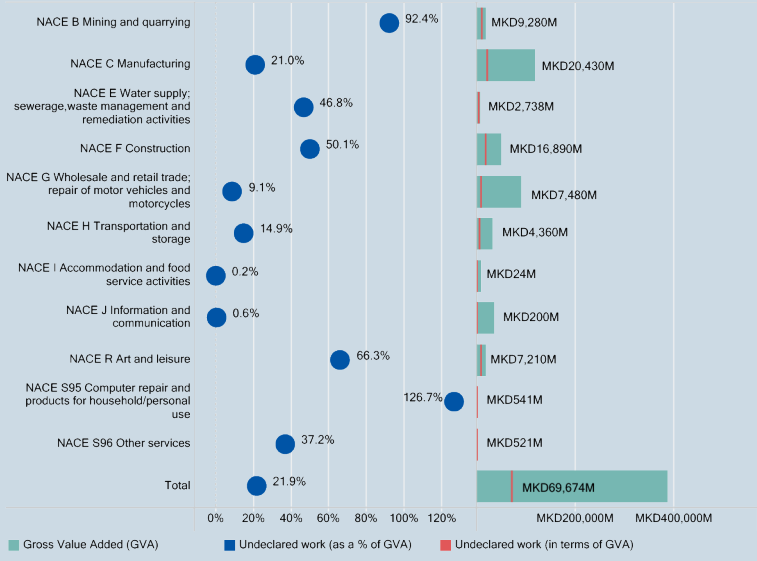
Figure 7 reports the undeclared work measured as a proportion of Gross Value Added (GVA), as well as the total GVA lost due to undeclared work by sector. This analysis also takes into account the average productivity of the labour input in each sector.[9] The undeclared work constitutes on average 21.9 per cent of the sample gross value added. This percentage is slightly higher than the undeclared work measured in terms of hours worked, which means that undeclared work is more pronounced in some sectors with higher productivity. The estimated lost GVA due to undeclared work is MKD 69.7 billion annually. As expected, the largest contribution to the lost GVA comes from the largest sector, manufacturing, but also from smaller sectors, such as mining and quarrying and construction, due to the higher GVA per labour input in those

[9] We use the average GVA per labour input based on sector and entity size differences and calculate the undeclared work as a percentage of GVA. Thus, this indicator can be interpreted as a weighted indicator where the productivity (average GVA per labour input) is used as a weight.

sectors. On the other side, the undeclared work in the second largest sector in terms of GVA, NACE G - Wholesale and retail trade; repair of motor vehicles and motorcycles, constitutes a lower percentage of GVA, 9.1 per cent, due to the lower productivity of the labour input in this sector. Similarly, the contribution of NACE I - Accommodation and food service activities is very limited, despite the higher percentage of undeclared work in terms of hours worked, due to the lower productivity of the workers in this sector.

Figure 7.

Undeclared work as % of total Gross Value Added (by sector, left), and the lost and total GVA (right)



Authors' calculations based on LFS/SBS 2022 from State Statistical Office of North Macedonia

Figure 8 shows the structure of the undeclared labour market in terms of contributions of different types of employment, namely, wage employment, self-employment, and unpaid family work, for the largest three sectors. In manufacturing, the undeclared work is largely manifested through employment relationship, with almost 90 per cent of it. As it is hard to remain unregistered in manufacturing, both as a firm and as a worker, due to factors like the need for a fixed place of work and additional workers beyond oneself and his/her family, it is more likely that the undeclared work in the sector manifests through underreporting of wages as 'envelope wage', a phenomenon documented in Finance Think (2017). In this early study, about 69 per cent of those insured at the minimum wage reported receiving an 'envelope wage', and very frequently in amounts as large as (the then) minimum wage. The finding is also aligned with our earlier observation that informal workers, as opposed to the documented undeclared workers here, are not frequent in manufacturing, where only 2.4 per cent of the employed in the sector reported informal.

In construction the situation is similar, but compared to manufacturing the self-employment has a higher contribution to undeclared work in terms of GVA. The latter is aligned with our portrayal of informal workers earlier, whereby construction was ranked second in terms of the total of informal workers and third in terms of their relative share (28.5 per cent). This finding is further consistent with the findings of Petreski and Petreski (2022) who identified plasterers and painters among others as usually operating as individuals or as small groups of individuals in offering their services, usually to households, fully under the radar of authorities. Conversely, in the wholesale and retail trade, repair of motor vehicles and motorcycles sector, self-employment has a dominant contribution to the undeclared work supplemented with an important share of family work. Again, this aligns with the identification of this sector as the third-largest employer of informal workers, as well as with Petreski and Petreski (2022) who documented vehicle mechanics (who would fall under repair of motor vehicles), or various forms of sellers on streets, stands or even within clothing boutiques (which fall under trade), to constitute an important share of unregistered enterprises.

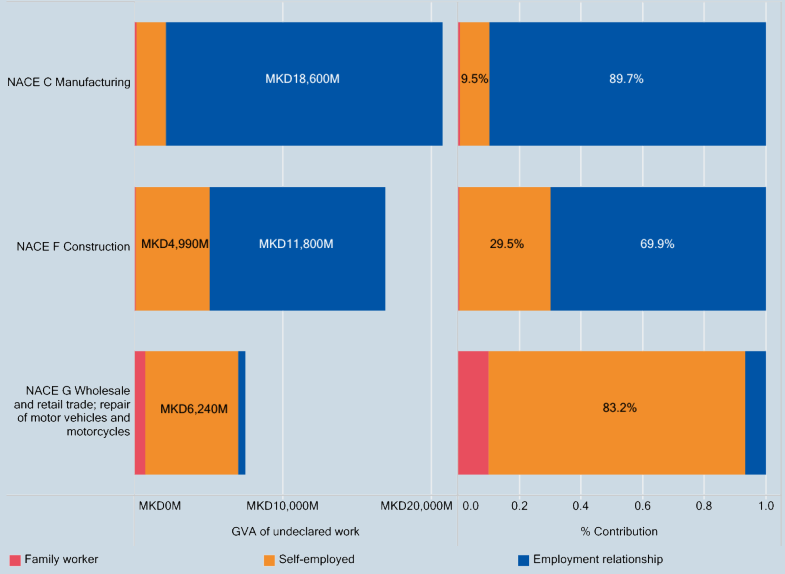
These results suggest that policy initiatives should differ with respect to the structure of undeclared work. For instance, the policy initiatives for easing business start-up may be more appropriate in the wholesale and retail trade, repair of motor vehicles and motorcycles sector where the transition from unemployment to self-employment will be smoother and less costly. In particular, initiatives like offering subsidized loans or loans with a grant component for formalization, well known in North Macedonia, but tailored to this specific sector or associated activities, may be adequate for activities like small-scale builders, plasterers, painters, mechanics-repairers etc. who alone or with their small group offer their services usually to households

but are disincentivized to register due to the perception of the high cost of doing business, although not necessarily the real cost of doing business. An educational campaign may be more helpful in this endeavor and less costly than employing inspectorates who may spend large resources while resulting in no registration gains simply because these activities are usually done in places hard to reach, like the rooms of a household or house's garages.

On the other hand, the policy measures in manufacturing and construction should include more aggressive monitoring to reduce under-declared waged employment. These are usually registered enterprises, workers and activities whose existence is easy to identify because of their size and fixed places of work. However, their 'envelope wages' or other ways of handling of the work hours stipulated in the contract are likely flagrant, which requires persistent actions of the Public Revenue Office and the State Labour Inspectorate. Prime actions may include understanding on individual basis if there are ways in which cash is sourced from the firm in a legal manner, which then serves to supplement envelope wages. Hence, the focus of the government work in this sector must not be chasing informal workers or non-registered businesses, but on tackling informal practices which supplement the formal work of the sector. Additionally, this deterrence approach should be supplemented with policy actions to improve the tax morale of the population, such as campaigns to raise awareness among employees about the benefits of not under-reporting salaries or the costs of under-reporting, or policy measures to reduce formal institutional inefficiencies and deficiencies to increase the trust in the government (Williams and Horodnic, 2015b)

Figure 8.

Undeclared work by type of employment (Largest 3 sectors)

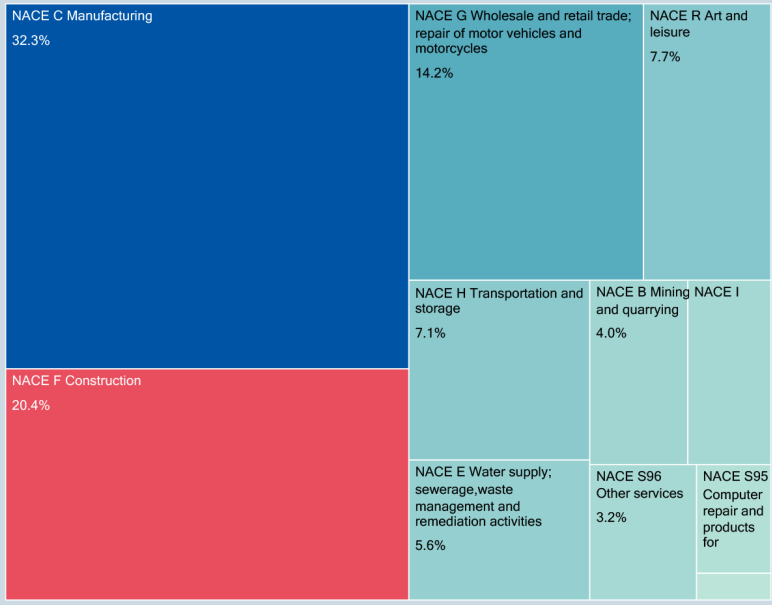


Authors' calculations based on LFS/SBS 2022 from State Statistical Office of North Macedonia

Figure 9 reports the contribution of each sector to the undeclared work in terms of labour input (hours worked). As expected, the largest three sectors capture two thirds of the undeclared work. However, two sectors of similar size (approximately 30,000 workers each), construction and transportation and storage, have different contributions. Construction's contribution is 20.4 per cent, while the transportation and storage sector's contribution is three times lower. Additionally, two sectors of smaller size (approximately 10,000 workers each) have significant contributions to the undeclared work. Water supply, sewerage, waste management and remediation activities contribute 5.6 per cent, while art and leisure activities contribute 7.7 per cent. Despite being three times smaller than the transportation and storage sector in terms of employment, these sectors together have more than double of the lost GVA due to undeclared work compared to the lost GVA of the transportation and storage sector (see Figure 7). This suggests that the government should consider not only the extent of undeclared work, but also the size of the sector in terms of employment as well as the differences in productivity across sectors and entity size levels.

Figure 9.

Contribution of each sector to undeclared work (in terms of labour input)

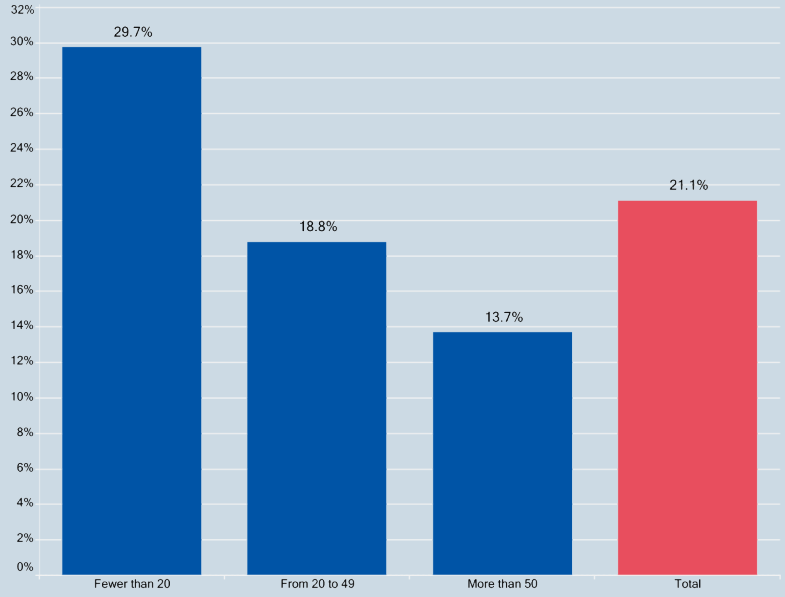


Authors' calculations based on LFS/SBS 2022 from State Statistical Office of North Macedonia

We conduct a similar analysis considering the variation of undeclared work with respect to the entity size. Figure 10 presents the prevalence of undeclared work with respect to the share of labour input across different entity size levels. Undeclared work is the most prevalent and equals 29.7 per cent in smaller firms with fewer than 20 workers which capture 42 per cent of the sample. In the firms with 20 to 49 workers, the share of undeclared work equals 18.8 per cent, while in the firms with more than 50 workers the share of undeclared work is the lowest at 13.7 per cent. We note that the largest share of workers, almost 45 percent, are employed in firms with more than 50 workers. As expected, this suggests that the undeclared work is more likely to occur in smaller firms, especially those with fewer than 50 workers. Although less prevalent, undeclared work in larger firms remains significant due to the substantial number of workers in that group, which is relevant for protecting workers' rights. In absolute numbers, the total undeclared labor input in smaller firms accounts for approximately 81 million hours, in medium-sized firms, 15,9 million hours and, in larger firms, 40 million hours. The policy lesson derived from this information is that the usage of state resources in combatting the informal economy should be primarily geared towards small firms and then towards medium-sized and larger firms.

Figure 10.

Undeclared work as a % of the labour input (by entity size)



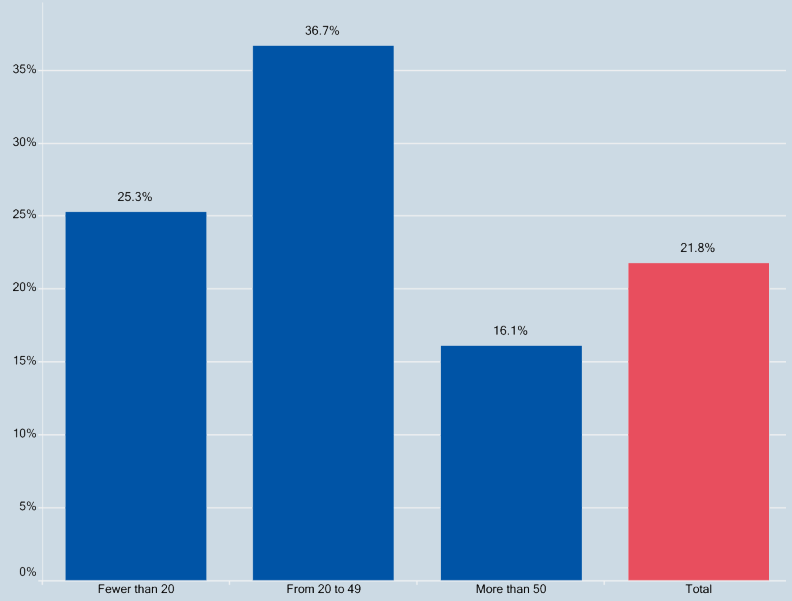
Authors' calculations based on LFS/SBS 2022 from State Statistical Office of North Macedonia

Figure 11 reports the undeclared work measured as a proportion of Gross Value Added (GVA) by entity size. The percentages differ due to sectoral differences in productivity for each entity size.[10] Evidently, the undeclared work conducted by more productive sectors is concentrated in larger firms resulting in higher percentages. In terms of the share of GVA, the undeclared work is the highest in the middle-size firms with 20 to 49 workers capturing more than a third of sample's GVA. The smallest firms have 25,3 percent of GVA attributed to the undeclared work which is lower compared to the percentage in terms of labour input suggesting that the undeclared work is driven by less productive sectors. On the other hand, the largest firms (with more than 50 employees) have a slightly higher share of undeclared work in terms of GVA.

[9] We note that the undeclared work measured as a proportion of GVA can be interpreted as a weighted indicator where the productivity (average GVA per labour input) is used as a weight. The higher is the weight, the higher this indicator will be.

Figure 11.

Undeclared work as % of total Gross Value Added (by entity size)



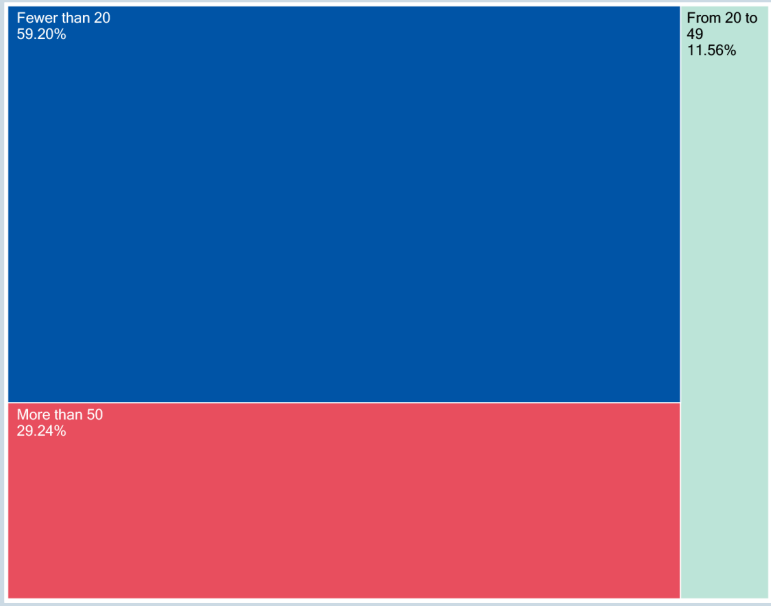
Authors' calculations based on LFS/SBS 2022 from State Statistical Office of North Macedonia

Finally, Figure 12 reports the contribution of each entity size level to the undeclared work in terms of labour input (hours worked). The largest contributors to the undeclared work are the smallest firms carrying almost 60 percent of the undeclared labour input. Although the largest firms capture as many workers as the smallest firms, their share in the undeclared labour input is half of the one of the smallest firms. Lastly, while the middle-size firms' contribution to the undeclared work is the lowest, as we have seen in Figure 11, their contribution in terms of GVA is very high indicating that undeclared work is driven by high-productivity activities. Thus, the government may prioritize policies depending on the objectives in tackling undeclared work. If the objective is to reduce the lost GVA due to undeclared work, then the policies should target middle-size companies, while if the objective is to reduce the prevalence of undeclared work to protect labour rights, then the policies should target smaller and larger firms. For instance, as middle-sized companies comprise a smaller population of firms, the government could implement stringent monitoring mechanisms specifically tailored for middle-sized firms to ensure compliance with labour regulations and tax reporting. Additionally, it may offer incentives to encourage a shift towards more transparent operations of middle-sized firms.

On the other hand, the monitoring costs of smaller firms might be higher due to a larger population of firms. Thus, the government should strive to establish easily accessible advisory services specifically designed for smaller businesses, offering guidance on legal obligations and facilitating compliance with labour laws, as well as to engage trade unions, local communities and associations to raise awareness about labour rights and the importance of transparent employment practices, encouraging a cultural shift towards compliance and fair labour standards among smaller firms.

Figure 12.

Contribution to undeclared work (in terms of labour input) (by entity size)



Authors' calculations based on LFS/SBS 2022 from State Statistical Office of North Macedonia

The analysis unveils the extent of undeclared work in North Macedonia, estimating its prevalence across sectors, entity sizes, and types of employment. Notably, undeclared work constitutes a substantial portion of labour input and Gross Value Added (GVA), with the manufacturing sector dominating these figures due to both its size and productivity. While some sectors exhibit high percentages of undeclared work, their contribution to the overall undeclared economy remains limited due to their smaller size. Interestingly, different sectors showcase varying forms of undeclared work, with manufacturing largely manifesting through wage underreporting and sectors like construction

and wholesale/retail involving a significant proportion of self-employment. These findings prompt nuanced policy approaches, suggesting that initiatives targeting middle-sized companies might be effective in curbing lost GVA, whereas policies directed at the smallest firms could be crucial for reducing the prevalence of undeclared work to protect labour rights. For instance, tailored monitoring mechanisms and incentivized compliance programs for middle-sized companies might aid in ensuring transparency and compliance, while easily accessible advisory services and community engagement initiatives could bolster compliance among smaller businesses, safeguarding labour rights and fostering a cultural shift toward fair labour standards. Additionally, the State Labour Inspectorate might focus its inspections on companies and sectors that have large shares of workers engaged in undeclared work, while the Public Revenue Office can focus on firms and sectors that have the higher GVA loss. If there is a scope for joint inspections between these two institutions, they should focus on the intersection including companies with large number of undeclared workers and high GVA loss.

Estimates of income underreporting in North Macedonia

To estimate the income underreporting in households in North Macedonia, we estimate equation (4),

$$lnC_i = \beta_0 + \beta_1 ln\left[\sum_j \bar{k}_j y_{ij}^R\right] + X_i\beta_2 + \varepsilon_i,$$

taking the expenditure for home utilities as the dependent variable and using nonlinear least square estimation. Under the assumption that pensions are correctly reported, we could identify the misreporting of other types of incomes. We use the household head's age, the number of members in the household and dummies for car possession (as a proxy for physical assets) and for education level to control the effects of household characteristics on housing costs.[11] Additionally, we analyze underreporting differences from three aspects: the occupation of the household head, the level of household income and the educational level of household head.[12] We define different groups of

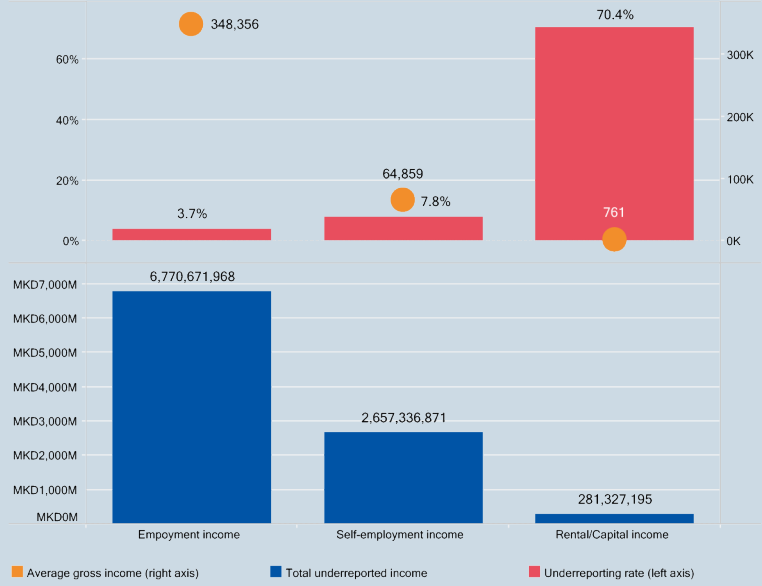
[11] In estimating equation (4), we apply the weights from North Macedonia's SILC 2018 which allow us to generalize the results to whole population. Also, we exclude the households which are below the 1st percentile and above the 99th percentile of disposable income.

[12] To estimate the underreporting rate for each group, we re-estimate equation (4) by using dummies to uncover the differences in k between the groups, and then recalculate the underreporting rates for each group based on the calculated differences.

households with white-collar household head and blue-collar household head, of households with more educated household head and with less educated household head, and of households with lower income level and with higher income level.[13] We assume that the occupation and educational level of the household head, as well as the level of income are important for the composition of the household income and underreporting tendencies may differ depending on the group.

Figure 13.

Underreporting rates by income type



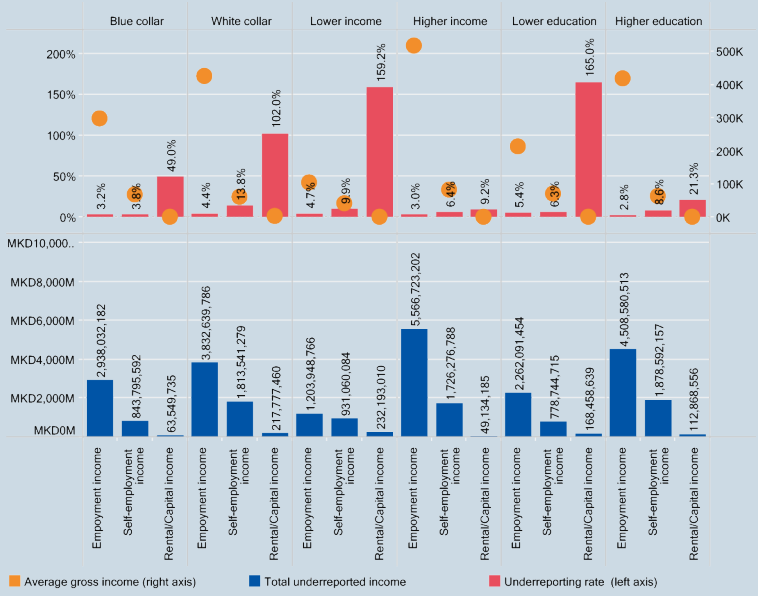
Authors' calculations based on SILC 2018 from State Statistical Office of North Macedonia

[13] We classify as white-collar households if the household head has an occupation code between 1 and 5, while the rest we treat as blue-collar households. If the household head has below a lower secondary education, we classify those households in the lower education group, while the rest in the higher education group. Finally, if the disposable income of the household is below the median, we classify them as lower income households, while if it is above the median, we include them in the higher income group.

We report the estimates of income underreporting in Figure 13 after estimating equation (4) and using equation (5) to calculate misreporting for each type of income.[14] The results show that the underreporting rates differ depending on income type. On average, households underreport 3.7 per cent of their employment income, 7.8 per cent of self-employment income and 70.4 per cent of rental income. Additionally, we calculate the average gross income for each income type across all households. As expected, the average gross self-employment and rental income is significantly lower than the average employment income because many households do not have or do not report self-employment and rental income. Based on the average gross income, we estimate the amount of non-reported income in North Macedonia. In total, approximately MKD9.7 billion (EUR157.8 million) are non-reported, of which, MKD6.8 billion (EUR110.6 million) from employment income, MKD2.6 billion (EUR42.3 million) from self-employment income and MKD0.3 billion (EUR4.9 million) from rental income.

Figure 14.

Underreporting rates by income type for different groups



Authors' calculations based on SILC 2018 from State Statistical Office of North Macedonia

[14] In all estimations, we find that k_j is not significantly different from 1.

When we focus on different groups of households the results may differ (Figure 14). For instance, white-collar head households have higher tendencies to underreport than blue-collar head households considering all income types. Regarding the self-employment income, the underreporting rate is more than three times higher in the white-collar group than in the blue-collar group. As the white-collar households have higher income on average, the non-reported income is higher. Additionally, lower income households have higher underreporting rates compared to higher income households, however the total non-reported income is lower due to the lower average gross income of these households. The non-reported employment income reaches MKD5.6 billion in the high-income group, which is more than a half of total non-reported income. Finally, the households with less educated household heads have higher tendencies to underreport their employment and rental income, while the households with more educated household heads have higher tendencies to underreport their self-employment income.

In summary, households in North Macedonia exhibit varying rates of underreported income across different income types, with employment income having the lowest and the rental income the highest underreporting rate. These rates of underreporting vary among household groups. White-collar households show higher tendencies to underreport across income types, especially in self-employment, aligning with their higher average income. Conversely, lower-income households exhibit higher underreporting rates but contribute less to the total non-reported income due to their lower average incomes. Notably, higher-income groups contribute substantially to non-reported employment income, amounting to more than half of the total non-reported income. Educational levels of household heads also play a role, with less educated heads prone to underreporting employment and rental income, while more educated heads tend to underreport self-employment income. Policymakers should consider targeted interventions, such as improved monitoring mechanisms for employment income and tailored awareness campaigns for different income groups, aiming to reduce underreporting and enhance tax compliance, ultimately bolstering government revenues for socioeconomic development.

7 Conclusions and policy recommendations

The informal economy stands as a substantial yet elusive aspect of many developing economies. In North Macedonia, governmental efforts to curb this issue have been ongoing, with strategies outlined in initiatives like the Strategy for Formalization of Informal Economy 2023-2027 and the Public Revenue Office's Strategic Plan 2023-2025. However, the true extent of the informal economy remains a challenge to ascertain due to its multifaceted nature. Existing indirect estimation methods, while valuable, fail to offer a granular view necessary for informed policymaking. In response, this study provides insights into three specific dimensions of North Macedonia's informal economy: informal workers, undeclared work and household income underreporting. Leveraging data from the Labour Force Survey 2022 and structural business statistics, alongside the Survey of Income and Living Conditions (SILC) 2018, we implement the Labour Input Method (LIM) to measure the extent of undeclared work and a consumption-based approach to measure underreported income. Informal workers are depicted based on their self-identification in LFS. These approaches enable us to delve into the complexities of the informal economy, providing insights into its prevalence and importance within the Macedonian economy.

In North Macedonia, informal workers are predominantly found in the agriculture, construction, and trade sectors. They typically operate within small enterprises, functioning as self-employed individuals or unpaid family workers, often earning salaries that fall below the legally mandated minimum wage. This category of workers primarily comprises men with lower level of education rather than women across various demographics.

The study offers insights into the landscape of undeclared work, which extends beyond informal workers to include informal practices of formal employment. Estimations revea that undeclared work constitutes approximately 21.1 per cent of the total labour input or MKD69.7 billion in terms of Gross Value Added (GVA). This prevalence spans across diverse sectors, notably showcasing a dominant presence in manufacturing, where it contributes significantly in terms of labour input and of GVA. Despite high percentages of undeclared labour input observed in certain sectors like construction (48.2 per cent), the overall impact on state tax revenues remains limited due to their smaller size within the economy. Intriguingly, the findings underscore distinct manifestations of

undeclared work across sectors, with manufacturing largely involving wage underreporting rather than informal workers, and sectors such as construction and wholesale/retail having significant proportions of self-employment hence a large portion of informal workers.

Regarding income underreporting within households, the analysis highlights stark differences among income types. In total, approximately MKD 9.7 billion (EUR157.8 million) are non-reported. Employment income displays a modest underreporting rate of 3.7 per cent comprising 70% or equal to MKD 6.8 billion (EUR110.6 million) of total losses in state revenues. Rental income reveals a significantly higher rate of 70.4 per cent equaling MKD 0.3 billion (EUR4.9 million) in state revenue losses. The rate of 7.8 per cent of unreported income from self-employment equals MKD 2.6 billion (EUR42.3 million) or approximately 27% of state revenue losses.

These disparities vary across household groups, with higher-income households contributing substantially to the non-reported employment income, totaling around MKD 5.6 billion, representing more than half of the total non-reported income. Moreover, while white-collar households exhibit a higher inclination towards underreporting across income types, lower-income households demonstrate higher rates but contribute less to the overall non-reported income due to their lower average incomes. These findings emphasize the need for targeted policy interventions, with specific strategies tailored to reduce underreporting in different income groups, thereby fostering tax compliance and bolstering government revenues for sustainable development.

The findings underline the necessity for a multifaceted policy approach that caters to the diverse facets of the informal economy prevalent in North Macedonia. Tailoring policy initiatives to align with the structural dynamics of undeclared work emerges as imperative. In low productivity sectors like wholesale and retail trade, repair of motor vehicles and motorcycles, where transitioning from unemployment to self-employment is smoother, fostering business start-ups through targeted initiatives becomes pivotal. Offering specialized financial aid, such as subsidized loans or grants, specifically tailored to support small-scale builders, painters, mechanics-repairers, and similar service providers coupled with support for improving businesses models, optimizing business processes and increasing productivity could incentivize formalization. Accompanying these financial and business strengthening incentives, with educational campaigns tailored for these sectors could prove instrumental in encouraging registration, offering a cost-effective approach compared to resource-intensive inspectorate interventions. Conversely, in sectors like manufacturing and construction, characterized by under-declared waged employment within registered enterprises, a different policy approach is essential. Implementing stringent monitoring measures targeted at identifying and addressing ‘envelope wages’—typically used to supplement reported

wages—demands sustained efforts and tailored actions from the State Labour Inspectorate and the Public Revenue Office. The former can focus its inspections on firms and sectors that have large shares of workers engaged in undeclared work, while the latter on firms and sectors that have the higher GVA loss. The intersection of high share of undeclared workers and high share of GVA can be grounds for joint inspections of the two inspectorates. Understanding the nuanced ways cash supplements these wages, legally sourced from companies, becomes imperative for effective intervention strategies.

Also, given the nuanced findings regarding undeclared work, a strategic approach encompassing targeted monitoring mechanisms for middle-sized companies emerges as a pivotal strategy to curtail lost Gross Value Added (GVA). These mechanisms should aim at ensuring transparency and compliance, thereby fortifying the state's revenue sources. Simultaneously, initiatives directed at smaller businesses, such as accessible advisory services and community engagement programs, stand crucial in fostering compliance with labour regulations and encouraging fair labour practices.

Additionally, policymakers should consider targeted interventions, such as improved monitoring mechanisms for employment income as well as educational campaigns designed for distinct income groups to significantly mitigate income underreporting, thus enhancing tax compliance. The integration of these multifaceted policies tailored to different sectors and entity sizes could pave the way for a comprehensive strategy that effectively tackles informal economic activities while safeguarding labour rights and bolstering government revenues.

While this study provides valuable insights into informal workers, undeclared work and income underreporting in North Macedonia, several limitations warrant acknowledgment. Firstly, a fundamental assumption relies on the accuracy of survey data from SILC 2018 and LFS 2022. However, inherent survey method issues and statistical factors could potentially compromise the reliability of these datasets, affecting the robustness of the estimations. Secondly, concerning the Labour Input Method, a significant hurdle persists in the scarcity of comprehensive information available through SBS, potentially limiting the depth and accuracy of the analysis. Thirdly, the consumption-based approach, while insightful, may underestimate the underreporting rates, especially in self-employment income. This method's assumption of uniform misreporting across households might lead to lower average effects if a substantial number of surveyed households have no self-employment income. Future research endeavors could benefit from expanding to incorporate a third approach utilizing tax data, which would introduce an additional dimension: tax avoidance/underreporting, particularly in terms of VAT. Expanding the study to include this perspective could offer a more comprehensive understanding of informal economic activities and further enhance policy recommendations aimed at curbing informal practices.

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