

Tatjana Spaseska, PhD

Faculty of Economics Prilep, University “St. Kliment Ohridski” Bitola, North Macedonia

E-mail: tatjana.spaseska@uklo.edu.mk

Ilija Hristoski, PhD

Faculty of Economics Prilep, University “St. Kliment Ohridski” Bitola, North Macedonia

E-mail: ilija.hristoski@uklo.edu.mk

Dragica Odžaklieska, PhD

Faculty of Economics Prilep, University “St. Kliment Ohridski” Bitola, North Macedonia

E-mail: dragica.odzaklieska@uklo.edu.mk

Aneta Risteska Jankuloska, PhD

Faculty of Economics Prilep, University “St. Kliment Ohridski” Bitola, North Macedonia

E-mail: aneta.risteska@uklo.edu.mk

MACROECONOMIC DETERMINANTS OF STOCK MARKET DEVELOPMENT: EVIDENCE FROM THE MACEDONIAN STOCK EXCHANGE

MAKROEKONOMSKE ODREDNICE RAZVOJA TRŽIŠTA KAPITALA: NALAZI SA MAKEDONSKE BERZE

Abstract

The stock market, as an important component of the capital market, plays a significant role in a capital formation process due to the tremendous opportunities that ensue from its activities. The establishment of a successful stock market in a developing economy can be one of the major sources of its economic growth if it provides development of the finance sector by channeling domestic savings and attracting foreign investments. In order to stimulate capital market development, it is necessary to analyze the determinants that influence its progress. Hence, the main objective of this study is to examine the important macroeconomic determinants that underpin the stock market growth. The focus has been put on the investigation of one dependent variable, market capitalization to GDP ratio, as a parameter resembling the size of the capital market, and how it depends on the economic growth, gross investments to GDP ratio, and trade openness. The empirical study is based on a time-series data analysis originating from valid secondary data sources, based on the utilization of the Johansen Test of Cointegration and the development of a Vector Error Correction model to estimate the relationship, the impact, the magnitude, and the significance of the determinants that support the development of the capital market in North Macedonia during the period from 2008:Q1 to 2018:Q4. The examination conducted in this paper shows the existence of a significant relationship between the observed macroeconomic factors and the stock market development. The findings indicate that economic growth has a negative impact, whereas trade openness has a significant, yet a positive impact on the Macedonian stock market development. The gross investments to GDP ratio exhibits a positive, but still insignificant impact on the stock market development.

Keywords: capital market, stock market development, macroeconomic determinants, North Macedonia**JEL:** G10, G17

Sažetak

Tržište dionica, kao važan sastavni dio tržišta kapitala, igra značajnu ulogu u procesu stvaranja kapitala zbog ogromnih mogućnosti koje proizlaze iz njegovih aktivnosti. Uspostavljanje uspješnog tržišta dionica u gospodarstvu u razvoju može biti jedan od glavnih izvora njegovog gospodarskog rasta ako osigura razvoj financijskog sektora usmjeravanjem domaćih ušteda i privlačenjem stranih ulaganja. Kako bi se potaknuo razvoj tržišta kapitala, potrebno je analizirati odrednice koje utječu na njegov napredak. Stoga je glavni cilj ove studije ispitati važne makroekonomske odrednice koje podupiru rast tržišta dionica. Naglasak je stavljen na istraživanje jedne ovisne varijable, omjeratržišne kapitalizacije i BDP-a, kao parametra koji sliči veličini tržišta kapitala, te kako on ovisi o gospodarskom rastu, omjeru bruto investicija u BDP-u i otvorenosti trgovine. Empirijska studija temelji se na analizi podataka iz vremenske serije koja potječe iz valjanih sekundarnih izvora podataka, temeljenoj na korištenju Johansenova testa kointegracije i razvoju modela vektorske korekcije pogrešaka (Vector Error Correction modela) za procjenu odnosa, utjecaja, veličine i značajnosti odrednica koji podržavaju razvoj tržišta kapitala u Sjevernoj Makedoniji tijekom razdoblja od 2008:Q1 do 2018:Q4. Istraživanje provedeno u ovom radu pokazuje postojanje značajne veze između promatranih makroekonomskih čimbenika i razvoja tržišta dionica. Nalazipokazuju da gospodarski rast ima negativan utjecaj, dok otvorenost trgovine ima značajan, a opet pozitivan utjecaj na razvoj makedonskog tržišta dionica. Omjer bruto investicija i BDP-apokazao je pozitivan, ali još uvijek neznatan utjecaj na razvoj tržišta dionica.

Ključne riječi: tržište kapitala, razvoj tržišta kapitala, makroekonomske odrednice, Sjeverna Makedonija

JEL: G10, G17

1. Introduction

The efficient financial sector is key to efficiency in the real economy. A well-developed financial system promotes investment by identifying and financing lucrative business opportunities, mobilizing savings, allocating resources efficiently, helping diversify risks and facilitating the exchange of goods and services (Mishkin, 2001, p. 11). The development of equity markets, as the most important part of the financial system, is crucial towards the further development of the financial system. The stock market increases flexibility in the financial intermediation process, as it provides investors with a clear exit strategy (Cherif & Gazdar, 2010, p. 140). The stock market provides a platform for raising funds and at the same time an opportunity to the investors. Namely, through the financial instruments that are offered on the capital market, the domestic savings are stimulated, and also they satisfy the needs of both individual and institutional investors. Therefore, companies which require financing may be listed on the stock exchanges by offering their shares to the general public through Initial Public Offering (IPO), while people invest in those companies by participating in the IPO. Because shares become available for trading at the stock exchanges, these play the role of intermediaries, by bringing both financiers and finances at the same platform. This way, a well-developed capital market offers an alternative way to the business sector for financing their investments, which leads to decreasing of their dependence on banks' loans. Thus, the increased competitive pressure on banking institutions is affecting the reduction of interest rates in the economy, which also creates potentials for higher economic growth.

Based on the results of the conducted research on the impact of the capital market on the financial sector development and economic growth, it is necessary to analyze the macroeconomic factors determining the capital market development. So, the main objective of the research in this paper is to analyze the determinants of the capital market development in the Republic of North Macedonia and on the basis of the obtained results to give measures and recommendations to the policymakers in direction of creating better strategies, in order to stimulate its development.

2. Literature review

The positive impact of stock market development on the economic growth initiated the researchers to determine the fundamental determinants of stock market development. A number of the researches were studied, which had derived number of variables such as liquidity in the market, economic growth, saving rates, banking sector development, new listing of capital, trade openness, opportunity cost as the alternative investment option available to the investor with minimum level of risk i.e. discount rate (DR), foreign investment, which are contributing towards the development of the stock market, macroeconomic stability in the country, *etc.*

Calderón-Rossell (1991) conducted one of the leading studies about the determinants of stock market development, suggesting that economic development and stock market liquidity are major determinants of stock market development. According to Calderón-Rossell, in the short-run, positive business cycles of a gross domestic product has a positive influence on the corporate profits and, accordingly, increase their value on the capital market. In the long term, with the increase in gross domestic product, there is a need for new financial instruments for economic agents in order to fertilize their income at a given level of risk. On the other hand, liquidity in the capital market refers to the ease and speed at which economic agents buy and sell financial instruments on the capital market.

Extensive studies have been conducted on the determinants of stock market development by adding further institutional and macroeconomic variables such as savings and investments, macroeconomic stability, development of the financial sector, *etc.*, to the model of Calderón-Rossell (1991). For instance, Sin-Yu (2017) examined the fundamental determinants of stock market development in South Africa using the ARDL bounds testing procedure. The results showed that both banking sector development and economic growth have a positive long-run impact, whereas inflation rate and trade openness have a negative long-run impact on stock market development. On the other hand, Raza *et al.* (2012) examined the impact of foreign direct investments and economic growth on stock market development in Pakistan using cointegration test based on ARDL bounds test, error correction model and rolling window estimation method and found that foreign direct investments, remittances, and economic growth had a positive impact on stock market development in the short- and long-run. El-Nader and Alraimony (2013, p. 91) implemented the maximum likelihood technique developed by Johansen (*i.e.* Johansen cointegration) to test the dynamic cointegration relationship between stocks market development and macroeconomic variables. Their results confirmed that banking sector development, domestic investment, consumer price index and stock market liquidity had a positive impact on stock market development, while nominal GDP and net remittances had a negative impact on stock market development. Kemboi and Tarus (2012, p. 57) examined macroeconomic determinants of capital market development in Kenya using Johansen-Julius cointegration technique. The findings indicated that macroeconomic factors comprising income level; banking sector development and stock market liquidity are important determinants of the Nairobi Stock Market.

A common characteristic of the previously mentioned studies is that all of them employ advanced econometric techniques based on time series analysis, as well as the Johansen cointegration technique, which is also used in our research.

3. Stock market evolution in North Macedonia

The modern history of the Macedonian capital market is associated with the structural changes in the 1990s of the 20th century when the process of country transition started. The process of privatization resulted in the formation of a larger number of shareholding companies, which posed a need for creating suitable market infrastructure for the transfer of newly-created securities. As a

result of that, the Macedonian Stock Exchange was founded in 1996. The development of the Macedonian Stock Exchange is based on two projects of mandatory listing, the first in 2002, and the second in 2013. As a result of the mandatory listing, the number of listed companies increased on 78 companies at the end of 2002, and 116 companies in 2013 (Spaseska *et al.*, 2019, p. 827).

The development of the capital market is usually considered through its size and depth. Indicator for the size of the capital market is market capitalization to GDP ratio, while the depth of the market that actually refers to its liquidity is measured by stock exchange turnover to GDP ratio and stock exchange turnover to market capitalization ratio (Turnover Ratio). Higher numbers of these indicators indicate a higher development of the capital market.

The Market Capitalization to GDP ratio in the observed period of time is depicted in Figure 1, while Figures 2 and 3 show the liquidity dynamics of the Macedonian Stock Exchange. Figure 1 shows a drastic fall of the Market Capitalization to GDP ratio in 2008, under the influence of the global financial crisis, which had a significant impact on the Macedonian securities market.

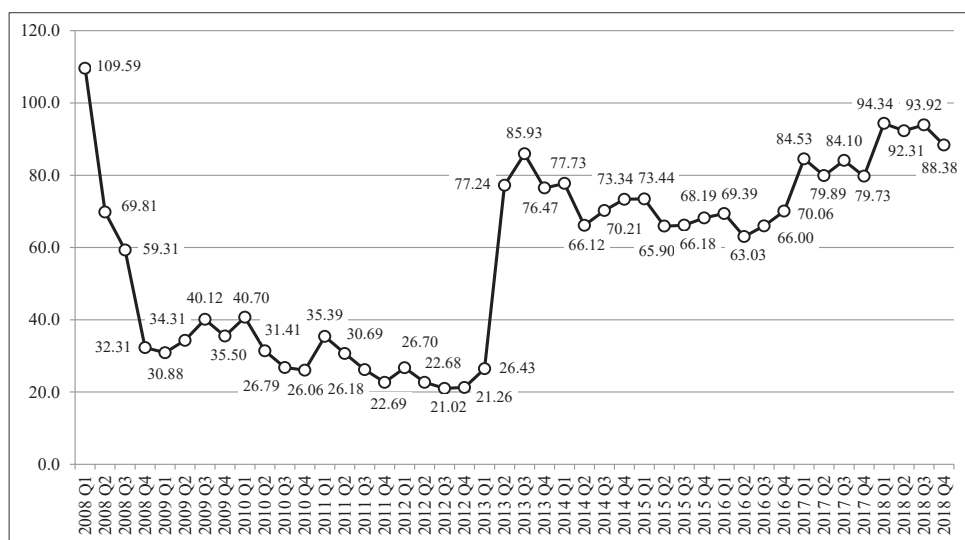


Figure 1. Market Capitalization to GDP ratio, in percentages (2008:Q1-2018:Q4)

Source: Annual reports of Macedonian Stock Exchange and State Statistical Office of the Republic of North Macedonia, 2008-2018)

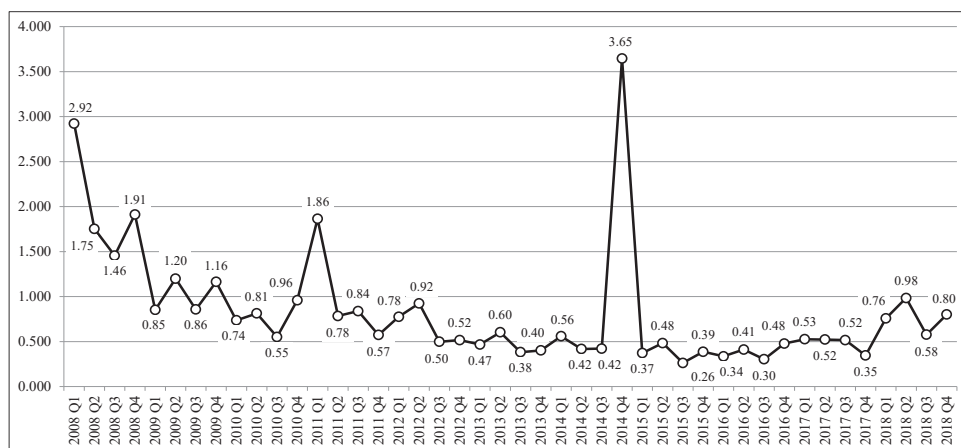


Figure 2. Stock Exchange Turnover to GDP ratio, in percentages (2008:Q1-2018:Q4)

Source: Annual reports of Macedonian Stock Exchange and State Statistical Office of the Republic of North Macedonia, 2008-2018)

Additionally, the fact that North Macedonia did not get the desired status as a member country of NATO Alliance had negative implications on the Stock Exchange operations. In 2013, an increase of this ratio (MC/GDP) is quite evident, which is a result of the second project of Mandatory Listing when the number of listed shareholding companies increased from 32 to 116; as a result, the market capitalization reached about 1.6 billion EUR and saw a rise of 277.18%. From Figure 1, it can be seen that the market capitalization of the listed companies from 2013 up to now has been in a continuous rise with small fluctuations, with an exception of the second quarter of 2015, which is a result of the prolonged political crisis in the country and refugee crisis.

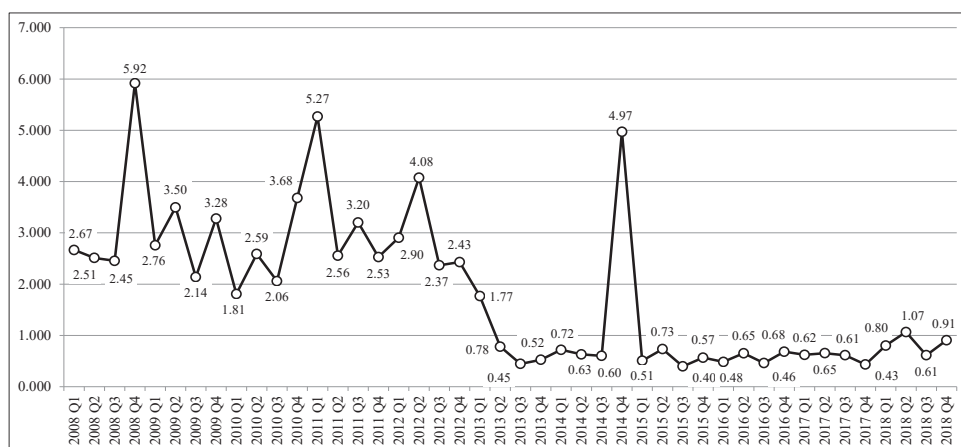


Figure 3. Stock Exchange Turnover to Market Capitalization ratio, in percentages (2008:Q1-2018:Q4)

Source: Annual reports of Macedonian Stock Exchange and State Statistical Office of the Republic of North Macedonia, 2008-2018)

The liquidity dynamics of the Macedonian Stock Exchange (Figures 2 and 3) show a continuous decrease of Stock Exchange Turnover to GDP ratio and Stock Exchange Turnover to Market Capitalization ratio, with an exception of 2015 when both ratios saw a drastic rise as a result of the realization of three new public offerings of stocks with a value of about 70.18 million EUR that caused an increase in stock exchange turnover of about 169.10%.

4. Data, methodology and results

4.1. Data

Our study is restricted to a single dependent variable and four independent variables, as follows:

- *Dependent variable*
 - Market Capitalization to GDP ratio (*MCGDP*), as a measure of the Macedonian capital market size;
- *Independent variables*
 - Real Gross Domestic Product (*GDP*) at current prices in MKD, as a measure of the economic activity in the country;
 - Gross Investments to GDP ratio (*GIGDP*), in percentages, as a measure of the investment rates in the country;
 - The level of the openness of the national economy, presented by the (a) Exports to GDP ratio, in percentages (*EXGDP*); and (b) Imports to GDP ratio, in percentages (*IMGDP*);
 - A dummy variable (*DUMMY*), which takes a value of 0 for the period from 2008:Q1 to 2013:Q1, and 1 for the period from 2013:Q2 to 2018:Q4; It is being introduced to capture the impact of the implementation of a mandatory listing, for the second time, back in 2013.

All the data used in this research have been exploited from secondary online sources only, i.e. the Macedonian Stock Exchange web pages (MSE, –), the State Statistical Office web pages (MAKStat Database, s.a.), and the National Bank of the Republic of North Macedonia web pages (NBRNM, s.a.), in a form of quarterly time series, covering the time period from 2008:Q1 to 2018:Q4.

4.2. Methodology

In order to determine the impact and the magnitude of the chosen independent macroeconomic determinants on the Macedonian capital market size, the initial regression equation we are estimating can be specified as follows [Equation (1)]:

$$MCGDP_t = \beta_0 + \beta_1 \cdot GDP_t + \beta_2 \cdot GIGDP_t + \beta_3 \cdot EXGDP_t + \beta_4 \cdot IMGDP_t + \beta_5 \cdot DUMMY_t + \varepsilon_t \quad (1)$$

With an aim to determine the order of integration of each of the individual variables found in Equation 1, we have used the Augmented Dickey-Fuller Test (ADF Test). An important practical issue for the implementation of the ADF test is the specification of the optimal lag length, p_{opt} , based on the maximal lag length, p_{max} . According to the common rule of thumb, suggested by Schwert (1989, p. 151), the maximal lag length, p_{max} , can be estimated using Equation (2).

$$p_{max} = \left\lceil 12 \cdot \left(\frac{T}{100} \right)^{\frac{1}{4}} \right\rceil \quad (2)$$

In Equation (2), T is the total number of observations in the time series, and $[x]$ denotes the integer part of x . Since all variables of interest contain $T = 44$ observations (11 years \times 4 quarters per year), the initial maximum lag, p_{max} , has been set to 9 for all ADF tests, whilst the specification of the optimal lag length, p_{opt} , has been done using the simple algorithm proposed by Ng & Perron (1995). The optimal lag order selection for the needs of the Johansen Cointegration Test, which is $p_{opt} = 4$,

has been conducted taking into account five criteria, including the Akaike Information Criterion (AIC).

The Johansen Cointegration Test was based on two tests to estimate the number of cointegration vectors (relationships) among the variables, including the Trace of the Stochastic Matrix test (λ_{trace}) and the Maximal Eigenvalue of the Stochastic Matrix ($\lambda_{\text{max_eigen}}$), which are both based on a same null hypothesis that there are no cointegration vectors among the variables. The number of cointegration vectors has been determined by using the Pantula principle, which helps in determining the presence/absence of deterministic elements in the regression equation by taking into account five options, including “Option 4. Intercept and trend in CE – no intercept in VAR”.

Based on the findings of the Johansen Test of Cointegration, the Vector Error Correction Model (VECM) of the regression equation (1) has been used for estimating the coefficients of the long-run equilibrium among the variables of interest, based on a VAR model with 3 lags (VAR 3) and Option 4, using one cointegration equation (equation #1), since we investigated the jointly effect of all independent variables on the dependent variable.

Finally, the resulting VECM has been subject to a diagnostic checking of the residuals against the existence of a serial correlation (autocorrelation), heteroscedasticity, and normality of their distribution. All the analyses have been carried out using the econometric package EViews v10.

4.3 Results and discussion

The results of the ADF test are given in Table 1, according to which all the variables are of order I(1), i.e. they are not stationary at level, but all become stationary after being first-differenced, which is a key premise for applying the Johansen Test of Cointegration.

Table 1. Results of the ADF Test

		Variable				
		MCGDP	GDP	GIGDP	EXGDP	IMGDP
In level	t-Statistics	-2.06536	3.00279	-0.94988	1.56091	-1.87291
	Crit. value (1%)	-3.59246	-3.63940	-3.60559	-3.63940	-3.59661
	Crit. value (5%)	-2.93140	-2.95112	-2.93694	-2.95112	-2.93315
	Crit. value (10%)	-2.60394	-2.61430	-2.60685	-2.61430	-2.60486
First difference	t-Statistics	-6.18697	-3.16762	-4.28807	-3.73275	-8.70242
	Crit. value (1%)	-3.59661	-3.61045	-3.62678	-3.61045	-3.59661
	Crit. value (5%)	-2.93315	-2.93898	-2.94584	-2.93898	-2.93315
	Crit. value (10%)	-2.60486	-2.60793	-2.61153	-2.60793	-2.60486
Order of integration		I(1)*	I(1)**	I(1)*	I(1)*	I(1)*

* = The Null hypothesis that the time series has a unit root has been rejected at $\alpha = 1\%$ level of significance

** = The Null hypothesis that the time series has a unit root has been rejected at $\alpha = 5\%$ level of significance

*** = The Null hypothesis that the time series has a unit root has been rejected at $\alpha = 10\%$ level of significance

Source: Authors' research

Based on the value of the LR criterion (53.86626), which was the lowest of all other criterions, the optimal number of lags for applying the Johansen Test of Cointegration is $p_{\text{opt}} = 4$. The number of cointegrating vectors has been estimated by using the Pantula principle (Table 2).

Table 2. Results of the appliance of the Pantula principle for testing the number of cointegrating vectors for the regression equation (1): $MCGDP = f(GDP, GIGDP, EXGDP, IMGDP, DUMMY)$

Number of cointegrating vectors	Option 1		Option 2		Option 3		Option 4		Option 5	
	λ_{trace}	λ_{max_eigen}	λ_{trace}	λ_{max_eigen}	λ_{trace}	λ_{max_eigen}	λ_{trace}	λ_{max_eigen}	λ_{trace}	λ_{max_eigen}
No vectors ($r = 0$)	×	×	×	×	×	×	×	×	×	×
At most 1 ($r = 1$)	×	×	×	×	×	×	×	×	×	×
At most 2 ($r = 2$)	×	×	×	×	×	×	×	×	×	×
At most 3 ($r = 3$)	×	√	×	×	×	×	×	×	×	×
At most 4 ($r = 4$)	×		√	√	×	×	√	√	√	√
At most 5 ($r = 5$)	√				√	√				

Note: × = The null hypothesis is being rejected at 5% level of significance; √ = The null hypothesis is being accepted at 5% level of significance

Source: Authors' research

We focused solely on Option 4 since it allows for the existence of a linear deterministic trend in data (i.e. in the cointegrating equation), whose presence is of a technical nature (i.e. it has no economic meaning). According to the test results presented in Table 2 for Option 4, the model variables $MCGDP$, GDP , $GIGDP$, $EXGDP$, and $IMGDP$, including $DUMMY$ are all cointegrated, meaning that they share a common stochastic trend and grow proportionally, by moving together in a long-run. Vector Error Correction estimates were obtained by specifying and running the corresponding VECM with $p = 3$ lags, for Option 4. The resulting cointegrating equation is a basis for inferring the Error Correction Term (ECT), given by Equation (3).

$$ECT_{t-1} = 1.000000 \times MCGDP_{t-1} - 4.07 \times 10^{-11} \times GDP_{t-1} + 0.037915 \times GIGDP_{t-1} + 0.080921 \times EXGDP_{t-1} - 0.089335 \times IMGDP_{t-1} + 0.040982 \times @TREND(08Q1) + 4.626554 \quad (3)$$

The $MCGDP$ as a target (dependent) variable is given by Equation (4), which can be yielded from the cointegration equation obtained during estimating the VECM.

$$\begin{aligned} \Delta MCGDP_t = & -0.542476 \times ECT_{t-1} + \\ & +0.284778 \times \Delta MCGDP_{t-1} - 0.072775 \times \Delta MCGDP_{t-2} + 0.150560 \times \Delta MCGDP_{t-3} - \\ & -1.40 \times 10^{-11} \times \Delta GDP_{t-1} - 6.85 \times 10^{-12} \times \Delta GDP_{t-2} + 3.07 \times 10^{-13} \times \Delta GDP_{t-3} + \\ & +0.005595 \times \Delta GIGDP_{t-1} + 0.004211 \times \Delta GIGDP_{t-2} - 0.004452 \times \Delta GIGDP_{t-3} + \\ & +0.027568 \times \Delta EXGDP_{t-1} + 0.027999 \times \Delta EXGDP_{t-2} + 0.002219 \times \Delta EXGDP_{t-3} - \\ & -0.024148 \times \Delta IMGDP_{t-1} - 0.016762 \times \Delta IMGDP_{t-2} - 0.004157 \times \Delta IMGDP_{t-3} - \\ & -0.146917 + \\ & +0.300620 \times DUMMY \end{aligned} \quad (4)$$

The significance of the coefficients in Equation (4) has been obtained by estimating Equation (4) utilizing the method of the Least Squares (Gauss-Newton / Marquardt steps), or, more specifically, by estimating the following equation, Equation (5).

$$\begin{aligned} D(MCGDP) = & C(1) * (MCGDP(-1) - 4.07271186028E-11 * GDP(-1) + \\ & 0.0379153470586 * GIGDP(-1) + 0.0809209266313 * EXGDP(-1) - \\ & 0.0893349619066 * IMGDP(-1) + 0.0409815480553 * @TREND(08Q1) + 4.62655407553) \\ & + C(2) * D(MCGDP(-1)) + C(3) * D(MCGDP(-2)) + C(4) * D(MCGDP(-3)) + C(5) * D(GDP(-1)) + \\ & C(6) * D(GDP(-2)) + C(7) * D(GDP(-3)) + C(8) * D(GIGDP(-1)) + C(9) * D(GIGDP(-2)) + \\ & C(10) * D(GIGDP(-3)) + C(11) * D(EXGDP(-1)) + C(12) * D(EXGDP(-2)) + C(13) * D(EXGDP(-3)) \end{aligned} \quad (5)$$

$$+ C(14)*D(IMGDP(-1)) + C(15)*D(IMGDP(-2)) + C(16)*D(IMGDP(-3)) + C(17) + C(18)*DUMMY$$

As per the long-run causality relationship investigation, the adjustment coefficient, which is the coefficient $C(1) = -0.542476$ multiplying the ECT, is found to be both negative and significant (Prob. = $0.0000 \leq 0.05$), meaning that the whole system is getting adjusted towards a long-run equilibrium at the speed of 54.25%. Coefficients $C(5)$, $C(11)$, $C(14)$, and $C(18)$ are all significant at a 0.05 level, i.e. the corresponding variables *GDP*, *EXGDP*, *IMGDP*, and *DUMMY*, have all statistically significant impact on the dynamics of the dependent variable. However, the coefficient $C(8)$ is not significant at a 0.05 level, i.e. the variable *GIGDP* has no statistically significant impact on *MCGDP*. The interpretation of the estimated coefficients in the VECM (Equation 4), assuming the *ceteris paribus* principle, is as follows:

- Coefficient $C(5) = -1.40E-11$: The increase in Gross Domestic Product (*GDP*) by 1 billion MKD would statistically significantly ($p\text{-Value} = 0.0113 \leq 0.05$) decrease the Market Capitalization to GDP ratio (*MCGDP*) by 1.40 percentage points. Generally, an increased GDP should lead to increased investments, which, in turn, are financed from various sources, including capital market. However, the results of the applied model have shown that the increased GDP does not have a positive impact on market capitalization. The main reason is that the business entities provide necessary capital by expensive bank loans in a form of long-term credits, while alternative forms of financing, such as financing through issuing securities, are used in a very small volume. So, companies use capital market financing rarely in a sense of resources collecting through an issue of new shares or debt instruments, which is a restricting factor for a more substantial scope of activities with the corporate sector.
- Coefficient $C(8) = +0.005595$: The increase in Gross Investments to GDP ratio (*GIGDP*) by 1% would statistically insignificantly ($p\text{-Value} = 0.3903 > 0.05$) increase the Market Capitalization to GDP ratio (*MCGDP*) by 0.56 percentage points.
- Coefficient $C(11) = +0.027568$: The increase in Exports to GDP ratio (*EXGDP*) by 1% would statistically significantly ($p\text{-Value} = 0.0352 \leq 0.05$) increase the Market Capitalization to GDP ratio (*MCGDP*) by 2.76 percentage points.
- Coefficient $C(14) = -0.024148$: The increase in Imports to GDP ratio (*IMGDP*) by 1% would statistically significantly ($p\text{-Value} = 0.0178 \leq 0.05$) increase the Market Capitalization to GDP ratio (*MCGDP*) by 2.41 percentage points.
- Coefficient $C(18) = +0.300620$: The effects of the implementation of a mandatory listing, for the second time, back in 2013, captured by the introduction of a dummy variable *DUMMY* in the model, are positive and statistically significant ($p\text{-Value} = 0.0000 \leq 0.05$).

The R-squared value of 0.683099 indicates that the independent variables explain quite well (a good portion, up to 68.31% of) the variability of the dependent variable, *MCGDP*. Since the F-statistics is significant at a 0.05 level of significance, i.e. Prob. (F-statistic) = $0.012602 \leq 0.05$, data are fitted quite well within the model. The residuals' diagnostic tests suggest that the VECM is correctly specified so it can be used for hypothesis testing and forecasting purposes, because:

- According to the Breusch-Godfrey Serial Correlation LM Test, Obs*R-squared = 1.169963 (Prob. Chi-Square(3) = $0.7602 > 0.05$), there is no serial correlation (autocorrelation, lagged correlation) in the residuals of the model, at a 5% level of significance;
- According to the Breusch-Pagan-Godfrey Heteroskedasticity Test, Obs*R-squared = 26.67435 (Prob. Chi-Square(21) = $0.1819 > 0.05$), there is no heteroscedasticity in the residuals of the model, at a 5% level of significance;
- According to the Jarque-Bera Test statistics = 4.629216 (Prob. = $0.098805 > 0.05$), the residuals of the model are normally distributed, at a 5% level of significance.

5. Conclusion

This paper examined the impact of selected macroeconomic determinants on stock market development in the Republic of North Macedonia. Specifically, the study investigated the extent to which economic growth, gross investments, and trade openness influence the capital market development in North Macedonia. The empirical study has been carried out on a compendium of time-series data, originating from valid secondary data sources. It utilizes the Johansen Test of Cointegration as a preliminary step that leads towards the development of a corresponding Vector Error Correction model, which was used to estimate the nature of the relationship among the factors that are fostering the development of the capital market in the country during the period from 2008:Q1 to 2018:Q4. The analysis results provided evidence of a significant relationship between the observed macroeconomic factors and the stock market development. The findings indicate that economic growth has a negative, whereas trade openness has a significant and positive impact on the Macedonian Stock Market development. Although the Gross Investments to GDP ratio showed a positive impact on stock market development, the coefficient was not significant. Based on the results of this research, and in order to accelerate the stock market development in the Republic of North Macedonia, it is recommended to create and implement effective and prudent policies that will stimulate the trade openness and the gross investments in the country. The results of the analysis revealed that the rise of GDP has a negative impact on the stock market development, which is not in line with the theory. On the contrary, it is essential for our country to implement economic policies which will lead to accelerated economic growth based on increased productivity. Simultaneously, a more aggressive campaign for promoting stock exchange operations should be carried out, i.e. measures for increasing the business sector awareness about the benefits of capital mobilization through issuing securities, which will decrease the role of bank credits in financing the current and developing work of the firms. In this manner, the activities on the Macedonian Stock Exchange would be encouraged, indirectly of its performances, which would have positive implications on the overall Macedonian economy. Since the development of the capital market in small and transitional economies like the Macedonian is expressed through its size and depth (liquidity), a challenge for our next research will be to study the relationship between the liquidity of the capital market and the same macroeconomic determinants that were hereby analyzed.

References

- 1) Calderón-Rossell, R. J. (1991) The Determinants of Stock Market Growth. In: Rhee, S. G. & Chang, R. P. (Eds.) *Pacific Basin Capital Markets Research Proceeding of the Second Annual Pacific Basin Finance Conference* (pp. 645-775), Vol. II, Bangkok, Thailand, 4-6 June.
- 2) Cherif, M. & Gazdar, K. (2010) Macroeconomic and Institutional Determinants of Stock Market Development in MENA Region: New Results from a Panel Data Analysis. *International Journal of Banking and Finance*. 7(1), pp. 139-159.
- 3) El-Nader, H. M. & Alraimony, A. D. (2013) The Macroeconomic Determinants of Stock Market Development in Jordan. *International Journal of Economics and Finance*. 5(6), pp. 91-103.
- 4) Kemboi, J. K. & Tarus, D. K. (2012) Macroeconomic Determinants of Stock Market Development in Emerging Markets: Evidence from Kenya. *Research Journal of Finance and Accounting*. 3(5), pp. 57-68.
- 5) MAKStat Database (s.a.) *Gross Domestic Product by expenditure approach, by quarters* [Online]. State Statistical Office of the Republic of North Macedonia, Skopje, North Macedonia. Available from: <http://makstat.stat.gov.mk> [Accessed: May 13, 2019]
- 6) Mishkin, F. (2001) Financial Policies and the Prevention of Financial Crises in Emerging Market Countries. NBER Working Paper No. 8087.
- 7) MSE (s.a.) *Reports* [Online]. Macedonian Stock Exchange AD. Skopje, Republic of North Macedonia. Available at: <https://www.mse.mk/en/reports> (Accessed: May 10, 2019).

- 8) NBRNM (s. a.) *Financial stability reports* [Online]. National Bank of the Republic of North Macedonia, Skopje, North Macedonia. Available at: https://www.nbrm.mk/izvieshtai_za_finansiskata_stabilnost-en.nspix (Accessed: May 10, 2019).
- 9) Ng, S. & Perron, P. (1995) Unit Root Tests in ARMA Models with Data-Dependent Methods for the Selection of the Truncation Lag. *Journal of the American Statistical Association*. 90(429), pp. 268-281. DOI: 10.1080/01621459.1995.10476510.
- 10) Raza, A., Iqbal, N., Ahmed, Z., Ahmed, M. & Ahmed, T. (2012) The Role of FDI on Stock Market Development: The Case of Pakistan. *Journal of Economics and Behavioral Studies*. 4(1), pp. 26-33.
- 11) Schwert, G. W. (1989) Tests for Unit Roots: A Monte Carlo Investigation. *Journal of Business & Economic Statistics*. 7(2), pp. 147-159.
- 12) Sin-Yu, H. (2017) The Macroeconomic Determinants of Stock Market Development: Evidence from South Africa. MPRA Paper No. 76493.
- 13) Spaseska, T., Odzaklieska, D., Risteska Jankuloska, A. & Risteska, F. (2019) The Effects of Mandatory Listing on Capital Market Development in the Republic of Macedonia. *Proceedings of the XI IBANESS Congress Series*, Tekirdağ, Turkey, pp. 823-831.