

ANALYZING THE DYNAMICS BETWEEN MACROECONOMIC VARIABLES AND THE MACEDONIAN STOCK EXCHANGE INDEX

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ABSTRACT

This paper presents an empirical analysis of the dynamic relationships between the Macedonian Stock Exchange Index and a set of macroeconomic variables including Gross Domestic Product (GDP), central bank bills interest rate, interest rates on deposits, inflation, and crude oil prices. Utilizing the Autoregressive Distributed Lag (ARDL) approach, we examine the short-term and long-term impacts of these variables on the stock market from Q1 2009 to Q3 2023. Our ARDL Bounds Test results confirm the presence of a cointegrated relationship, indicating that the stock market and macroeconomic variables are mutually influenced over the long term. In the long run, increases in GDP positively impact the Macedonian stock exchange market, while rising central bank interest rates exert a negative effect on the MBI10 index. While, in the short term, only changes in oil prices and the stock index itself are found to have significant impacts on the MBI-10, with the error correction term indicating a swift adjustment to equilibrium after short-term shocks. This study contributes to the literature by providing nuanced insights into the macroeconomic determinants of stock market performance in North Macedonia, offering implications for policymakers and investors regarding the critical factors influencing market dynamics. The findings underscore the importance of economic growth for stock market vitality, the critical role of monetary policy, and the sensitivity of the stock market to oil price volatility, emphasizing the need for strategic economic policies to foster a stable and growth-conducive market environment.

Keywords: *Macedonian Stock Exchange Index, Macroeconomic Variables, ARDL Model.*

JEL classification: *G10, E44, C22.*

1. INTRODUCTION

Financial institutions contribute to the national economy by accumulating capital funds to meet the financial needs of different productive and business sectors (Gupta, 1982). Financial markets are broadly classified into money markets and capital markets. Transactions in short-term debt instruments or marketable securities are done in the money market, whereas long-term securities (bonds and stocks) are traded in the capital market (Kovács and Kajtor-Wieland, 2017). According to Ehrmann *et al.* (2011), the money market is the financial market for short-term borrowing and lending and provides short-term liquid funding for the financial system, whereas the capital market is the financial market for long-term borrowing and lending and provides long-term liquid funding for the financial system, including government bonds, institutional bonds, and stocks. The stock market is a major component of the securities market (Boehme and Colak, 2012). A stock market is the center of a network of transactions where buyers and sellers of securities meet at a specified price (Bologa and Cavallo, 2002). Stock markets play a pivotal role in facilitating economic development by efficiently allocating capital among investment opportunities, enabling companies to secure funds for expansion, and encouraging savings through portfolio diversification, thus fostering economic growth (Adam *et al.*, 2016). The role of these markets is important in the way that they mobilize the domestic resources of the economy and channel them to productive investment (Comincioli, 1995).

There is a widespread acknowledgment among analysts, scholars, and policymakers that the advancement of financial markets, particularly stock markets, is crucial for promoting economic growth. This emphasis on stock market development aligns with the guidance provided by international and regional organizations, highlighting the importance of integrating such markets into a country's financial system. The performance of a nation's stock market is believed to reflect that country's economy. Since the previous few eras, the reputation of the stock market around the world unlocked different pathways of investigation into the financial progress and stock market growth. While the importance of stock market development is widely recognized, there is no universal consensus on the specific determinants that drive it. Therefore, identifying key factors influencing stock market development is of paramount importance. Many factors can be a signal to stock market participants to expect a higher or lower return when investing in the stock market and one of these factors is macroeconomic variables, (Talla, 2013). Numerous researchers in this area showed that share prices are determined based on macroeconomic influences such as industrial production, interest rate, consumer price index, inflation rate, exchange rate, money supply, etc. (Mukherjee and Naka, 1995; Pilinkus and Boguslauskas, 2009; Eita, 2012; Kabir *et al.*, 2014; Soti, 2015; Majeed and Masih, 2016; Khatri, 2019; Devkota and Dhungana, 2019; Verma and Bansal, 2021). Stock analysts usually believe that economic factors have an enormous effect on stock market prices. Understanding the interplay between macroeconomic factors and stock market performance is essential, given that macroeconomic variables significantly influence stock market behaviour and returns.

In North Macedonia, stock markets are relatively underdeveloped compared to their counterparts in other regions. Challenges such as the dominance of the banking sector, limited trading volume due to a small number of listed companies, and market volatility due to speculation hinder stock market development. However, these challenges can be addressed through reforms aimed at improving banking services, enhancing legal frameworks, and incentivizing private companies to go public. The relationship between stock markets and macroeconomic variables remains a topic of debate.

To address this gap in the literature, this study aims to analyse the development of stock markets in Macedonia and its relationship with key macroeconomic variables such as GDP,

interest rate, inflation, and crude oil prices. By employing an autoregressive distributed lag (ARDL) model, the study seeks to understand the relationship between stock market prices and major macroeconomic variables. It can further help policymakers and investors to keep an eye on the stock market. The remaining part of the paper is organized into three sections. Section 2 reviews the literature relevant to the present study. Data, methods, and results are discussed in Section 3 and Section 4 presents the concluding remarks.

2. REVIEW OF THE EMPIRICAL LITERATURE

Mukherjee and Naka (1995) conducted a seminal investigation into the relationship between the Tokyo Stock Exchange index and various macroeconomic variables. Employing vector error correction models, they identified long-term associations between the stock market index and factors such as call money rates, inflation rates, exchange rates, and industrial production. Similarly, Muradoglu *et al.* (2000) examined causal relationships among inflation rates, interest rates, industrial production, exchange rates, and stock returns across nineteen emerging markets. Their findings underscored the significant role of country-specific factors in determining stock market returns, emphasizing the importance of conducting country-level analyses over-generalized panel data approaches for informed policy formulation.

Extending the scope of macroeconomic influence studies, Ben Naceur *et al.* (2007) analysed stock market development in the Middle East and North Africa (MENA) region. Utilizing panel data analysis, they found that savings rates, domestic credit to the private sector, stock market liquidity, and inflation significantly influenced stock market development. In contrast, income levels and investment did not exhibit statistically significant impacts. Humpe and Macmillan (2009) provided a comparative analysis of how macroeconomic variables influence stock market movements in the United States and Japan. Their findings indicated that U.S. stock prices were positively related to industrial production but negatively correlated with interest rates and the consumer price index. Conversely, Japanese stock prices exhibited a negative association with both industrial production and money supply.

Investigating the interplay between oil prices and stock markets, Bjørnland (2009) focused on Norway, an oil-exporting country. By applying a Vector Autoregression (VAR) model that included the stock market index, industrial production, inflation rate, and oil prices, the study found that increases in oil prices led to a rise in stock market prices. This suggests that in oil-exporting countries, higher oil prices can positively impact stock market performance due to increased revenues from oil exports. Investigating short-term dynamics, Pilinkus and Boguslauskas (2009) explored the relationships between macroeconomic variables and the stock market index in Lithuania. Their results suggested that increases in GDP and money supply were associated with rises in the stock market index, whereas higher unemployment rates, exchange rates, and interest rates were linked to declines in index values. Similarly, Filis (2010) examined the relationships between macroeconomic variables, the stock market, and oil prices in Greece from 1996 to 2008. The study revealed that oil prices had a significant negative impact on the Greek stock market in the long run. Additionally, industrial production positively influenced the stock market, while inflation exerted a negative effect. Hussain *et al.* (2012) investigated the impact of various macroeconomic variables on Indian stock prices through multiple regression analysis. Their findings indicated that oil and gold prices had a significant negative influence on stock prices. In contrast, factors such as the balance of trade, GDP, industrial production, interest rates, foreign exchange reserves, and money supply positively affected stock prices. In the context of African markets, Eita (2012) analysed the macroeconomic determinants of stock market prices in Namibia using a vector error correction model. The study concluded that economic activity, interest rates, inflation, money supply, and exchange rates significantly influenced Namibian stock prices. Specifically, exchange rates,

income levels, and inflation demonstrated a positive relationship with stock prices. Focusing on the ASEAN region, Miseman *et al.* (2013) assessed the influence of macroeconomic factors—including interest rates, broad money supply, domestic output, and inflation—on stock prices in Malaysia, Indonesia, Thailand, Singapore, and the Philippines. Their findings revealed that these macroeconomic variables significantly affected stock prices across the region.

In the context of economic crises, Bellalah *et al.* (2013) studied the relationship between stock exchange prices and macroeconomic variables such as interest rates, money supply, and oil prices in the USA, Japan, and China. Their research focused on the period during the global economic crisis and provided valuable insights into how these variables influenced stock prices differently across these distinct economies during times of financial instability. Investigating European markets, Degiannakis *et al.* (2014) examined the impact of oil price shocks on European stock markets using a structural vector autoregressive model. The study suggested that increases in oil prices significantly affected the demand side of the economy, ultimately leading to a negative impact on stock markets. Turning to Nepal, Soti (2015) explored the long-run relationship between the Nepalese stock market and macroeconomic variables by utilizing the Autoregressive Distributed Lag (ARDL) model. The study concluded that, despite some short-term fluctuations, there existed a long-run relationship between the NEPSE index and variables such as the consumer price index, money supply, and interest rates. Building upon this, Devkota and Dhungana (2019) employed the ARDL bounds testing approach to confirm further the long-run association between macroeconomic variables and stock market performance in Nepal.

Collectively, these studies underscore the significant influence of macroeconomic factors on stock prices across various economies, both developed and emerging. Accordingly, the present study aims to investigate the impact of changes in macroeconomic variables on Macedonian stock market prices, thereby providing crucial insights for policymakers and investors.

3. DATA, METHODOLOGY AND RESULTS

An empirical study is based on a data set covering the quarterly period from 2009Q1 to 2023Q3. The stock market prices are shown through the Macedonian Stock Exchange Index – MBI10, consisting of the ten most liquid shares on the Macedonian stock exchange. The data for the value of the MBI10 index is obtained from the Macedonian stock exchange database. Macroeconomic determinants on the MBI10 index are CB bills (reference) interest rates, interest rates on deposits, which are obtained for the Central Bank database, the State Statistical office as a source for data for GDP and inflation, and data for oil prices from West Texas Intermediate crude oil prices per barrel (Pilinkus, 2010; Eita, 2012; Giri and Joshi, 2017; Karakostas 2023). Before testing the model and determining the influence on the variables, Table 1 presents some basic descriptive statistics. Note that the values in the descriptive statistics table reflect the statistics of the raw data but in further analyses, some of the variables are going to be used by taking their natural logarithm.

The descriptive statistics indicate a wide range of values for the MBI10 index, with a minimum value of 1 575 index points and a maximum of 6 278 index points. The average value is 3 171 index points with a standard deviation of 1 519 points, suggesting notable variability in the data relative to the mean. The average GDP is 148 207 million denars, with significant variability ranging from 92 764 million denars to 217 461 million denars. Its standard deviation of 31 359 million denar underscores fluctuations in economic output. Inflation, with a mean of 0.23% and a standard deviation of 0.63%, remains relatively low but exhibits notable variability, with rates ranging from -1.75% (deflation) to 2.77%. Central bank bills interest rates show moderate means of 3.69% with standard deviations suggesting stability in lending environments. The

interest rates on deposits demonstrate an average of 1.47% with a standard deviation of 0.58%, indicating a range from 0.53% to 2.78%, reflecting the interest environment for depositors within the period studied. The volatility of oil prices, ranging from \$18.38 to \$125.45 with a mean of \$76.86 and a standard deviation of \$25.22, also highlights significant external economic factors.

Table 1: Descriptive statistic

Variables	Mean	Standard Deviation	Minimum	Maximum
Macedonian Stock Exchange Index (MBI10)	3 171	1 519	1 575	6 278
Gross domestic product (GDP) (in million denars)	148 207	31 359	92 764	217 461
Inflation (in %)	0.23	0.63	-1.75	2.77
Central bank bills interest rate (CBB_IR) (in %)	3.69	1.85	1.25	9.00
Interest rate on deposits (IR_D) (in %)	1.47	0.58	0.53	2.78
Oil prices (in dollars per barrel)	76.86	25.22	18.38	125.45

(Source: Authors' compilation)

According to suggestions from the literature review and the characteristics of our financial system, the study employs an autoregressive distributed lag (ARDL) model because of its flexibility in handling variables that are integrated at different orders, such as $I(0)$ or $I(1)$. This makes it particularly suitable for our analysis, where some macroeconomic determinants may exhibit varying levels of stationarity. Peseran and Shin (1999) first proposed this autoregressive distributed lag method, which has indeed gained wide application in empirical research. This approach was further elaborated by Peseran *et al.* (2001) using it to examine the existence of a long-run cointegrating relationship between variables. Cointegration represents the existence of a stationary linear combination between non-stationary variables, (Engle and Granger, 1987). This implies that despite the stochastic movement of the variables, a stable long-term relationship can be identified between them. Compared with other techniques of determining the cointegration relationship such as Granger's cointegration method, (Engle and Granger, 1987), Johansen's cointegration method, or Johansen's cointegration technique, (Johansen and Juselius, 1990), the autoregressive model approach is preferred, if there is a different order of integration between the variables, $I(0)$ and/or $I(1)$, as long as no variable is integrated from the second order. Hence, the first step of the time series analysis is examining the stationarity of the variables. According to Gujarati (2003), a series can be considered stationary if its mean and variance are constant over time. In order to determine the integrative characteristics of the time series, the Augmented Dickey–Fuller (ADF) and the Phillips–Perron (PP) unit root tests, which were developed by Dickey and Fuller (1979), Phillips and Perron (1988), respectively, are used in this study. The unit root test results are shown in Table 2. Note that the null hypothesis for the ADF and the PP tests is that the variable has a unit root (nonstationary) while the alternative hypothesis suggests stationarity. Combining two different unit root tests enables us to examine both the null hypotheses of the nonstationary. According to the test results, some of the variables are stationary at a level while some others become stationary after the first difference, so the ARDL Bounds test can powerfully analyze the short-run and long-run relationships between the stock market and its macroeconomic determinants.

Table 2: Augmented Dickey–Fuller (ADF) Unit Root Test

	Variables	MBI10	GDP	Inflation	CBB_IR	IR_D	Oil prices
In level	t-statistics	-0.11	0.12	-5.78	-5.25	-2.54	-2.39
	Test critical values 10% level	-2.59	-2.61	-2.60	-2.60	-2.61	-2.61
First difference	t-statistics	-7.07	-16.16			-8.60	-8.24
	Test critical values 10% level	-2.59	-2.60			-2.60	-2.60
	Stationarity	I (1)	I (1)	I (0)	I (0)	I (1)	I (1)

(Source: Authors' calculations)

Table 3: Phillips–Perron (PP) Unit Root Test

	Variables	MBI10	GDP	Inflation	CBB_IR	IR_D	Oil prices
In level	t-statistics	-0.21	-1.34	-5.78	-1.86	-2.45	-2.51
	Test critical values 10% level	-2.61	-2.61	-2.61	-2.61	-2.61	-2.61
First difference	t-statistics	-7.13	-24.35		-5.21	-8.61	-8.23
	Test critical values 10% level	-2.60	-2.60		-2.60	-2.60	-2.60
	Stationarity	I (1)	I (1)	I (0)	I (1)	I (1)	I (1)

(Source: Authors' calculations)

Furthermore, the required autoregressive distributed lag model has the following form:

$$\ln(\text{MBI10}) = a_1 \ln(\text{MBI10}) + a_2 \ln(\text{GDP}) + a_3(L)\text{CBBIR} + a_4(L)\text{INF} + a_5(L)\text{IR}_D + a_6(L)\ln(\text{OilP}) + \mu_t$$

Where μ_t is the error term that contains the remaining variables affecting the dependent variable, and they are not included in the independent variables, and $a_j(L)$ are time delays defined as:

$$a_1(L) = a_{11}L + \dots + a_{1p}L^p,$$

$$a_j(L) = 1 + a_{j1}L + \dots + a_{jp}L^p, \quad j \geq 2,$$

Firstly, to identify the existence of a co-integration relationship, the autoregressive distributed lag model is based on the Wald-test (F-statistic), the critical values of the F-test are given by Peseran *et al.* (2001). The lower critical value assumes that all variables are integrated of order zero I(0), so there is no cointegration relationship between the variables involved. Whereas the upper critical value assumes that all variables are integrated of the first order I(1), so that there is cointegration between the variables. Hence, when the resulting F-test value is greater than the upper critical value, the null hypothesis is rejected (H0), and the variables in the model are cointegrated. Conversely, if the resulting F-test value is below the lower critical value, then the

null hypothesis cannot be rejected (H0), and when the value is between the lower and upper critical value, the conclusion is unsupported, the existence of a cointegration (long-term) relationship between the variables cannot be determined with certainty.

Namely, if we determine that there is cointegration between the variables, this model will further allow us to estimate coefficients related to this long-term equilibrium, as well as estimate the short-term coefficients and the error correction term, the rate at which variables adjust to long-run equilibrium.

Hence, to determine the number of time lags for each of the variables, the Akaike information criterion is used. Thus, in this regression equation, the Akaike information criterion suggests the following model ARDL (3,1,0,0,3,0).

The performed test gives us the coefficient of the F-statistic 4.05, when compared with the defined limits indicating that there is a co-integration between the dependent and independent variables at a significance level of 1%, table 4.

Table 4: Cointegration Test (F-Bounds Test)

Test statistics	Value	Significance level	I(0)	I(1)
F-statistics	4.05	10 %	2.08	3
K	5	5 %	2.39	3.38
		1 %	3.06	4.15

(Source: Authors' calculations)

Furthermore, we move on to the estimation of the long-term test with constant and no trend (Long Run Form, Case 3: Unrestricted Constant and No Trend), which gives us the long-term coefficients of each of the variables, which are shown in the following table 5.

Table 5: Estimation of the long-term test with constant and no trend

Dependent variable LMBI10	
	Independent variable
LGDP	4.381*
CBB IR	-0.138*
IR D	0.413
INFLATION	-0.066
LOIL PRICES	-0.893
*, ** and *** mean rejection of the null hypothesis that the coefficient is not statistically different from zero at the 10, 5, and 1% level of significance	

(Source: Authors' calculations)

The estimation results reveal that the long-term coefficient for GDP is statistically significant, demonstrating a robust positive impact on the stock market index. This finding underscores the vital role of economic growth in driving stock market performance, as increases in GDP signal economic expansion, higher corporate earnings, and greater consumer spending, all of which contribute to rising stock prices. Furthermore, the analysis highlights the influence of the central bank interest rate, which exhibits a typically inverse relationship with the stock market index. Higher CBB interest rates increase borrowing costs for businesses and consumers, potentially curbing investment and spending, thereby exerting downward pressure on stock prices. Conversely, lower interest rates reduce borrowing costs, fostering investment and spending, and positively impacting stock prices. The coefficient before the interest rate on deposits shows no significant long-term impact suggesting a nuanced relationship between deposit rates and stock market performance that may require further exploration to fully understand its dynamics within the Macedonian financial system. Inflation, and oil prices,

represented by their respective coefficients, indicate a negative influence on the LMBI10, albeit not reaching traditional levels of statistical significance. Furthermore, through this model, we will try to examine the short-term relationships between the dependent and independent variables, as well as the dynamic adjustment coefficient, which shows the speed with which the short-term deviation is corrected to the long-term balance. The obtained results are presented in Table 6.

Table 6: Estimation of short-term relationships and dynamic adjustment coefficient

Dependent variable LMBI10	
	Independent variable
Δ LMBI10 ₋₂	-0.420***
Δ LOIL_PRICES ₋₁	-0.182**
Δ LOIL_PRICES ₋₂	-0.143*
ECT ₋₁	-0.070***
R ²	43.10%
*, * * and *** mean rejection of the null hypothesis that the coefficient is not statistically different from zero at the 10, 5, and 1% level of significance	

(Source: Authors' calculations)

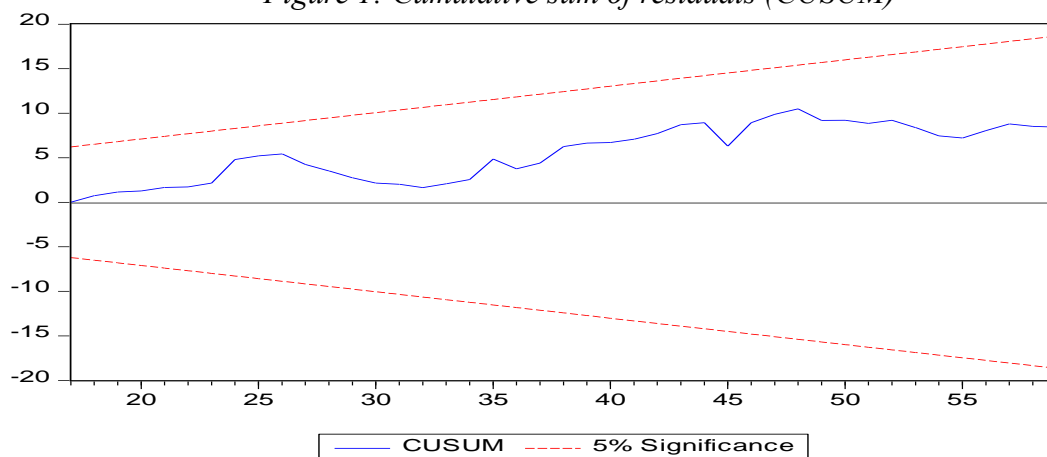
From the obtained results of the error correction method (ECM), we can conclude that in the short term, the value of the MBI10 index from the two periods back negatively affects the current level of the MBI10 index. The oil prices from one and two periods back have a negative effect on the value of the MBI10 index. The statistically significant negative coefficient of -0.420 suggests that a decline in the MBI10 index two periods ago tends to be followed by an increase in the current period. This counterintuitive finding could be reflective of a corrective mechanism in the market where, after a period of decline, prices adjust upwards towards their mean or long-term trend. This phenomenon is often related to "mean reversion" in financial markets, where prices tend to move back toward the mean or average levels over time after periods of volatility. This could indicate that after experiencing declines, the market may see opportunities for buying undervalued stocks, leading to increased buying activity that drives prices up. Investors might perceive the declines as temporary and see value in entering the market at lower prices, anticipating future gains as the market corrects itself. The negative coefficients for the lagged changes in oil prices (-0.182 and -0.143, respectively) indicate that recent increases in oil prices adversely affect the stock market in the short term. In an energy-importing country like North Macedonia, higher oil prices can increase production and transportation costs, leading to higher inflation and reduced disposable income for consumers. This can dampen economic activity and corporate earnings, leading to lower stock prices. The lagged effects suggest that the market may take time to fully absorb and react to changes in oil prices, reflecting the transmission lag between oil price changes and their economic impact. Despite the statistical significance and the expected negative sign of the error correction term (ECT (-1)), its coefficient is notably low in magnitude. This low value indicates a slow speed of adjustment of the stock market index back to its long-run equilibrium after experiencing short-term shocks. In other words, when deviations occur, it takes a considerable amount of time for the index to revert to its equilibrium state. This sluggish adjustment process could be due to market inefficiencies, structural rigidities, or behavioral factors among investors that impede rapid correction. The prolonged impact of shocks suggests that short-term disturbances have lasting effects on the stock market, which has important implications for investors and policymakers alike. Additionally, the dynamic adjustment coefficient (the error correction term) has the expected negative sign at the 1% significance level. To ensure the robustness of

our ARDL model, we conducted several diagnostic tests. The Breusch-Pagan-Godfrey heteroskedasticity test indicated no evidence of heteroskedasticity in our model's residuals, confirming that the variance of the residuals is constant and supporting the reliability of our coefficient estimates (Breusch and Pagan, 1979; Godfrey, 1978). The Breusch-Godfrey Serial LM test for autocorrelation suggested that there is no autocorrelation detected in the residuals (Breusch, 1978; Godfrey, 1978). The Ramsey RESET test for model specification implied that our model is correctly specified, with no signs of omitted variables or incorrect functional form (Ramsey, 1969). These results reinforce the adequacy of our model in capturing the relationships between the dependent and independent variables. Regarding the normality of residuals, the Jarque-Bera test led us to conclude that the residuals are approximately normally distributed (Jarque and Bera, 1980). Finally, plots of the cumulative sum of recursive residuals (CUSUM) confirm that the estimated parameters are within the critical bounds and stable over the sample period (Pesaran, 1997; Pesaran and Shin, 1999).

Table 7: Summary of Diagnostic Test Results

Test	Test Statistic	Degrees of Freedom	P-value
Heteroskedasticity Test			
- Breusch-Pagan-Godfrey F-statistic	1.704781	(12, 43)	0.0995
- Obs*R-squared	18.05327	12	0.1141
Autocorrelation Test			
- Breusch-Godfrey LM F-statistic	1.484024	(1, 42)	0.2299
- Obs*R-squared	1.9111.911169	1	0.1660.1668
Model Specification Test			
- Ramsey RESET F-statistic	0.790884	(1, 42)	0.3789
Normality of Residuals Test			
- Jarque-Bera Statistic	5.96430		0.0507

Figure 1: Cumulative sum of residuals (CUSUM)



(Source: Authors' Compilation)

4. CONCLUSION

This study embarked on a detailed exploration of the interplay between key macroeconomic variables and the Macedonian Stock Exchange Index (MBI-10) over the period from Q1 2009 to Q3 2023. Utilizing the autoregressive distributed lag (ARDL) model, we uncovered significant insights into how economic factors influence stock market performance in both the short and long term. Our findings underscore the complex dynamics at play and offer critical perspectives for investors, policymakers, and economists alike.

In the long term, the positive impact of GDP on the stock market index (LMBI10) underscores the fundamental importance of sustained economic growth in driving stock market performance (Soti, 2015; Devkota and Dhungana, 2019). This relationship highlights the need for policies that promote economic expansion, as higher GDP growth translates into higher corporate earnings and increased consumer spending, which collectively enhance stock market valuations. Additionally, the inverse relationship between the CBB interest rate and the stock market index emphasizes the critical role of monetary policy in shaping market dynamics (Humpe and Macmillan, 2009; Mukherjee and Naka, 1995). Elevated interest rates can constrain investment and spending, thereby exerting downward pressure on stock prices, while reduced interest rates can foster a more favorable environment for market growth.

The short-term analysis, augmented by the error correction model (ECM), highlighted the market's sensitivity to past performance and external shocks, such as oil price fluctuations. Particularly, the negative effect of past declines in the MBI-10 index underscores a momentum effect where past performance significantly impacts future market dynamics (Pilinkus and Boguslauskas, 2009). Furthermore, the negative short-term impacts of oil price increases on the stock market index underscore the Macedonian economy's vulnerability to external commodity price shocks, reflecting the broader challenges faced by energy-importing countries (Filis, 2010; Degiannakis *et al.*, 2014). The significance of the error correction term in our short-term analyses emphasizes the market's efficiency in adjusting to deviations from long-term equilibrium, underscoring the inherent resilience and corrective mechanisms within the Macedonian stock market (Soti, 2015; Devkota and Dhungana, 2019).

Our study offers several implications for policymakers and market participants. Firstly, the pivotal role of GDP and monetary policy (reference interest rate) in supporting the stock market suggests that policies aimed at sustaining or stimulating economic growth could be beneficial for market performance. Specifically, measures that promote economic expansion and consumer spending, while maintaining favorable borrowing conditions, are likely to enhance corporate earnings and boost stock prices. Secondly, the inverse relationship between the CBB interest rate and the stock market highlights the importance of carefully calibrated monetary policies. Lowering interest rates can stimulate investment and consumption, thereby positively influencing stock market performance, whereas higher rates may need to be balanced against potential adverse effects on market dynamics. Thirdly, the sensitivity of the stock market to oil price shocks calls for enhanced energy policy frameworks and diversification strategies to mitigate adverse impacts. By addressing these factors, policymakers can better support sustainable market growth and resilience.

For future research, delving into microeconomic determinants such as corporate governance, financial performance indicators, and sectoral analyses could enrich our understanding of the Macedonian stock market's dynamics. Additionally, exploring the potential lagged effects of macroeconomic variables and integrating global economic indicators could provide a more holistic view of the factors influencing the MBI-10. This approach not only lays a foundation for further research but also offers practical insights for enhancing the resilience and growth of the Macedonian stock market.

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