

FINANCIAL PERFORMANCE INDICATORS AND STOCK RETURNS: A DECADE-LONG ANALYSIS OF MBI10 FIRMS IN NORTH MACEDONIA

Bojan Malcev

Assistant at Ss. Cyril and Methodius University in Skopje, Faculty of Economics – Skopje
bojan.malcev@eccf.ukim.edu.mk

ABSTRACT

This paper investigates the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia over a ten-year period from 2013 to 2022. A total of 100 observations from the Macedonian stock market index (MBI10) are analyzed, using audited financial statements as the primary data source. The financial performance indicators studied include Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and Dividend per Share (DPS). A multiple linear regression model is applied to examine the impact of these indicators on annual stock returns, with the model estimated through ordinary least squares (OLS) estimation. The research tests four hypotheses, aiming to establish significant positive relationships between ROA and Stock Return, as well as EPS and Stock Return. The results confirm the hypotheses related to ROA and EPS, with significant positive impacts on Stock Return. However, the relationships between ROE, DPS, and Stock Return lack statistical significance. The findings suggest that the financial performance indicators considered in this study only account for a limited proportion (4.9%) of the variations in Stock Return, indicating the influence of other essential factors not included in the model. To enhance the reliability of the findings, a robustness check was conducted by introducing two control variables: Macedonian GDP annual real growth rates, and DAX30 Index annual rate of return. The regression model, including these control variables, exhibited almost the same results as the model without them. Furthermore, the model with the control variables demonstrated a slightly higher Adjusted R Square value (0.058) compared to the model without them (0.049), implying a slightly improved explanatory power. This study highlights the complexities of the Macedonian stock market and emphasizes the importance of investigating additional factors that significantly contribute to stock price movements and returns in this specific market context.

Keywords: *Stock return, ROA, ROE, EPS, DPS*

JEL Classification: *G12, M41.*

1. INTRODUCTION

In recent years, there has been a growing interest in understanding the factors that influence stock returns and the relationship between financial performance indicators and stock market performance. The stock market plays a critical role in the economy, as it serves as a platform for companies to raise capital and for investors to allocate their resources. Investors often seek to maximize their returns by making informed investment decisions based on the financial performance of companies. At the same time, company managers aim to enhance their financial performance to attract investors and boost shareholder value. The aim of this paper is to explore

<http://doi.org/10.47063/EBTSF.2023.0008>

<http://hdl.handle.net/20.500.12188/28846>

the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia. This study is motivated by the need to understand the dynamics of the Macedonian stock market and the influence of financial performance on stock prices. The MBI10 index represents a selected group of prominent companies listed on the Macedonian stock exchange, making it a relevant sample for studying stock market performance in the country. To achieve this objective, we will analyze a comprehensive dataset covering a period of ten years, from 2013 to 2022, and encompassing 100 observations from the MBI10 companies. The study will focus on four key financial performance indicators: Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and Dividend per Share (DPS). These indicators are widely used to assess a company's profitability, efficiency, and ability to generate returns for its shareholders. The study will investigate how these financial metrics are associated with annual stock returns in North Macedonia. The methodology employed in this study involves a quantitative analysis of financial data obtained from audited financial statements of the MBI10 companies. These financial statements provide reliable and comprehensive information about the financial performance of the companies over the specified ten-year period. Data on financial performance indicators (ROA, ROE, EPS, and DPS) and annual stock returns will be collected from the Macedonian stock exchange's official website (www.mse.mk) and other reliable financial databases. The study will employ a multiple linear regression model to examine the relationship between financial performance indicators and annual stock returns. The multiple linear regression model allows us to identify and quantify the impact of each independent variable (ROA, ROE, EPS, and DPS) on the dependent variable (annual stock return), while controlling for potential confounding factors. In order to enhance the reliability and validity of the findings, a robustness check will be conducted to assess the stability and consistency of the relationships between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia. For this purpose, two additional control variables will be introduced in the analysis: 1. Macedonian GDP annual real growth rates, and 2. DAX30 Index annual rate of return. The model will be estimated using the Statistical Package for the Social Sciences (SPSS) software. The results of the multiple linear regression analysis will be presented and discussed to assess the significance and direction of the relationships between financial performance indicators and annual stock returns. The findings will shed light on the influence of each independent variable on the dependent variable, providing valuable insights into the factors affecting stock prices in the context of the MBI10 companies in North Macedonia. The paper comprises five main sections: Introduction, Literature Review, Methodology, Results and Discussion, and Conclusion. Each section contributes to a comprehensive analysis of the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia.

2. LITERATURE REVIEW

Financial performance indicators play a crucial role in assessing a company's profitability, efficiency, and ability to generate returns for its shareholders. Investors, analysts, and stakeholders often rely on these performance metrics to evaluate the financial health and potential of a firm. Among these indicators, Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and Dividend per Share (DPS) are widely used in financial analysis due to their significance in decision-making processes. This literature review aims to explore and synthesize existing research on the relationship between these financial performance indicators

and average annual stock returns, shedding light on the influence of these metrics on shareholder wealth and stock market performance. Various financial indicators provide insights into a company's profitability and efficiency. The association between financial data and stock prices is elucidated by several theoretical frameworks, such as the Efficiency Market Hypothesis (EMH) and signaling theory. According to the EMH, stock prices encompass all currently available information, including financial indicators (Borges, 2010). In contrast, the signaling hypothesis posits that financial indicators can serve as signals of a company's financial stability and future potential, influencing investors' evaluations of the company's value and leading to fluctuations in stock prices (Hayes, 2022). The study by Indraswono (2021) assesses company performance using both traditional and modern techniques on the New York Stock Exchange, focusing on the Dow Jones index. The research analyzed two performance indicators, Economic Value Added (EVA) and traditional metrics (ROA, ROE, EPS, and DPS), using purposive sampling on 29 Dow Jones-listed companies from 2015 to 2018. The findings indicated that the traditional indicators had a significant and positive effect on Stock Return, while EVA had an insignificant and negative impact on Stock Return. Moreover, all indicators collectively demonstrated a significant and positive influence on Stock Return. Kopecká (2018) highlights that financial measures, particularly return on investment (ROI) and earnings, are valuable indicators providing meaningful information to shareholders and significantly influencing market value. However, the superiority of Economic Value Added (EVA) remains uncertain, and companies tend to prefer traditional financial measures over other financial tools. Musallam (2018) investigates the relationship between financial ratios and market stock returns in 26 Qatari listed firms from 2009 to 2015. The study finds that earnings per share, earnings yield ratio, and dividend yield ratio have a significant and positive relationship with market stock returns, while other ratios like market to book value ratio, return on assets, return on equity, price to earnings ratio, dividends earnings ratio, and net profit margin show insignificant relationships with market stock returns. Al-Lozi and Obeidat (2016) conducted a study on 65 manufacturing companies listed on the Amman Stock Exchange over a 10-year period (2001-2011) to investigate the relationship between financial indicators (profitability and leverage measures) and stock return. The results indicate that gross profit margin (GPM), return on assets (ROA), return on equity (ROE), and earnings per share (EPS) have a significant relationship with stock return, while net profit margin (NPM) and leverage measures (debt ratio, debt-to-equity ratio, and current ratio) do not show a significant relationship with stock return. Har and Ghafar (2015) conducted a study to examine the impact of ROA, ROE, and ROCE on stock returns for plantation companies listed on the Main Board of Bursa Malaysia, focusing on two distinct economic periods - prior to (2004-2006) and during (2007-2008) an economic recession. The research findings revealed that ROE had the highest explanatory power in explaining the variations in stock returns, while ROA and ROCE showed a positive and significant relationship with stock returns only during the economic period before the recession. Garba (2014) conducted a study to investigate the influence of dividend-per-share on common stock returns of manufacturing firms listed on the Nigerian Stock Exchange. The data from ten randomly selected companies were collected for the period 1991-2003, and multiple regressions and Pearson Moment Correlation were employed. The study found a highly significant positive relationship between dividend-per-share and common stock returns, indicating that dividend payments impact the stock returns of the sampled firms. Avdalović and Milenković (2017) conducted an empirical investigation to assess the association between different company performance indicators (ROA, ROE, EPS, etc.) and the stock price of firms listed on the Belgrade Stock Exchange during the period from 2010 to 2014.

The study confirmed a statistically significant correlation between company performance and stock price. Similarly, Parlakkaya and Kahraman (2017) employed earnings per share (EPS) and book value per share as independent variables and stock price as the dependent variable to examine how accounting information influences stock prices. The regression analysis revealed a direct link between stock price fluctuations and profitability ratios such as EPS and book value, suggesting that data from a company's balance sheet and income statements play a role in shaping stock prices. On the other hand, Tsipouridou and Spathis (2014) conducted a study in Greece, concluding that audit opinions are not associated with earnings management. In a related study, Choiriyah et al. (2020) found that both Return on Assets (ROA) and EPS significantly affect the stock prices of banking companies listed on the Indonesia Stock Exchange (IDX). As per the results of Claudia and Indrati's (2021) investigation, Return On Assets (ROA) does not appear to influence stock prices, while earnings per share (EPS) has a positive impact on stock prices. The evidence supporting the usefulness and relevance of accounting data in transition economies remains limited. Financial markets in European transitional economies, including North Macedonia, may exhibit reduced value relevance compared to Western economies due to several factors. Firstly, Jindrichovska (2001) suggests that these marketplaces may be less efficient. Secondly, despite the progress of financial markets, Eastern and Central European nations maintain bank-oriented financial systems, with a limited number of banks responsible for most of the company financing (Ali and Hwang, 2000). Lastly, the majority of nations in Eastern and Central Europe operate under a code-law legal system. According to Ball et al. (2000), the political nature of the standard-setting process in Eastern and Central Europe reduces the necessity for swift and conservative accounting income. Additionally, tax regulations contribute to the decreased value relevance of accounting data in these regions, where accounting earnings closely align with taxable income due to their use of the Continental accounting model. Another justification for the increased value relevance of accounting data in these countries is that financial statements serve as the primary and often sole source of information for investors in developing markets. As such, market prices are more likely to reflect accounting figures, particularly since investors have limited access to information beyond publicly available accounting data. Furthermore, the adoption of International Financial Reporting Standards (IFRS) by all listed businesses in Eastern and Central Europe has been instrumental in enhancing investor trust in accounting statistics and the overall utility of accounting information (Filip and Raffournier, 2010). Prior research in accounting and finance emphasizes the significance of investigating the impact of EPS and ROA on stock prices. EPS, representing the profit attributed to each existing share of common stock, serves as a crucial measure of a company's performance. Previous studies have consistently shown a strong positive relationship between EPS and stock prices (Dang et al., 2020; Agrawal and Bansal, 2021; Gharaibeh et al., 2022). Likewise, ROA, gauging the profit generated per unit of assets, acts as an essential indicator of a company's profitability and efficiency. Multiple studies (Baker and Powell, 2000; Alaagam, 2019; Ligocká and Stavárek, 2019) have highlighted the considerable positive impact of ROA on stock prices.

3. METHODOLOGY

This section outlines the methodology employed in the study that aims to explore the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia. The study covers a period of 10 years, from 2013 to 2022, and analyzes a total of 100 observations representing the 10 companies listed on the Macedonian stock market index

(MBI10). The primary source of data for this research is the audited financial statements of the MBI10 companies. These statements provide comprehensive and reliable information regarding the financial performance of the companies over the specified period. The financial statements were accessed through reliable sources, such as annual reports and financial databases, available on the Macedonian stock exchange's official website (www.mse.mk), ensuring the accuracy and consistency of the data. The dependent variable in this study is the annual stock return, which represents the percentage change in the stock price of a company over a specific year. The independent variables of interest are the financial performance indicators, including Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and DPS (Dividend per Share). These indicators are commonly used measures to assess a company's profitability, efficiency, and ability to generate returns for its shareholders. To ensure the robustness and validity of the multiple linear regression model used to explore the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia, additional control variables will be introduced: 1. Macedonian GDP annual real growth rate, and 2. DAX30 Index annual rate of return. These control variables will provide a comprehensive evaluation of the impact of the financial indicators on stock returns while considering the influence of external economic and market factors. Table 1 provides a description of the employed variables in the paper.

Table 1: Description of the Variables

Variables	Abbreviation	Measurement
Average Stock return	STOCK_RETURN	The difference between the stock prices at the end of the current year and the stock price at the end of the previous year.
Return on Assets	ROA	The Ratio between net profit after tax and average assets.
Return on Equity	ROE	The Ratio between net profit after tax and average equity.
Earnings per Share	EPS	The ratio between net earnings available to common shareholders and average outstanding common shares.
Dividend per Share	DPS	The total dividend payments divided by the number of shares outstanding.
GDP annual real growth rate	GDP	Macedonian GDP annual real growth rate,
DAX30 annual rate of return	DAX30	DAX30 Index annual rate of return (represents the performance of the 30 largest publicly traded companies in Germany)

(Source: Author's elaboration)

To examine the relationship between the financial performance indicators and annual share returns, a multiple linear regression model will be applied using the Statistical Package for the Social Sciences (SPSS) software. The multiple linear regression allows for the identification and quantification of the impact of each independent variable on the dependent variable while controlling for potential confounding factors. The multiple linear regression model will be constructed, with the annual share return serving as the dependent variable and the financial performance indicators (ROA, ROE, EPS, and Dividend per Share) as the independent variables.

The model will be estimated using ordinary least squares (OLS) estimation technique to determine the coefficients and significance levels of each independent variable. The model is formulated as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$$

Where: β_0 represents the intercept term, the constant value; β_1 , β_2 , β_3 , and β_4 are the regression coefficients that estimate the effect of each independent variable on the dependent variable $Y =$ Stock Return; $X_1 =$ ROA; $X_2 =$ ROE; $X_3 =$ EPS; $X_4 =$ DPS and $\epsilon =$ random error.

Based on prior literature and theoretical considerations (Clubb and Naffi, 2007; Haghiri and Haghiri, 2012; Ebrahimi and Chadegani, 2011; Al-Lozi and Obeidat, 2016), the following hypotheses will be tested:

Hypothesis 1 (H1): There is a significant positive relationship between ROA and Stock Return.

Hypothesis 2 (H2): There is a significant positive relationship between ROE and Stock Return.

Hypothesis 3 (H3): There is a significant positive relationship between EPS and Stock Return.

Hypothesis 4 (H4): There is a significant positive relationship between DPS and Stock Return.

These hypotheses suggest that higher values of ROA, ROE, EPS, and DPS will correspond to higher annual share returns for the MBI10 companies in North Macedonia. The hypotheses posit a positive relationship between these financial performance indicators and annual share returns, indicating that stronger financial performance and greater returns to shareholders are expected to be associated with higher share returns in the market.

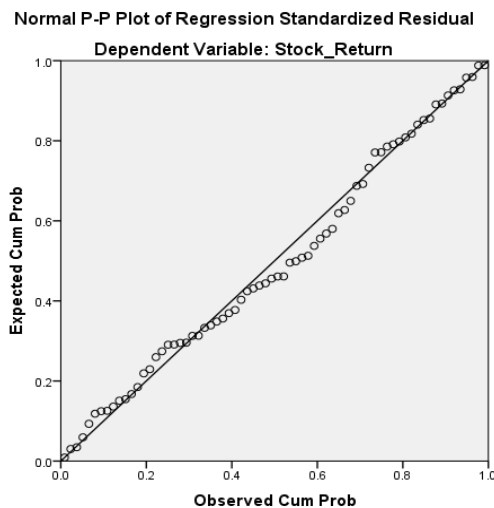
Moreover, various diagnostic tests will be conducted to evaluate the assumptions of the model. These tests encompass linearity, normality, homoscedasticity, multicollinearity, and autocorrelation. In case any of these assumptions are violated, appropriate remedial actions will be taken, such as data transformations or the inclusion of interaction terms, to address the issues. The first assumption is related to the presence of a linear relationship between the dependent and independent variables. It is crucial for accurate estimation in multiple regression analysis. If the relationship is not linear, the results may underestimate the true relationship, leading to inaccurate estimations (Osborne and Waters, 2002). The second assumption focuses on the normal distribution of variables. When variables exhibit severe skewness, kurtosis, or contain significant outliers, it can distort correlations and significance tests, impacting the accuracy of the analysis (Osborne and Waters, 2002). Homoscedasticity is another important assumption. It indicates that the variance of errors remains constant across all levels of the independent variables. On the contrary, heteroscedasticity occurs when the variance of errors varies at different values of the independent variables (Osborne and Waters, 2002). While minor heteroscedasticity may not significantly affect significance tests, substantial heteroscedasticity can distort the results, increasing the risk of Type I errors (Berry and Feldman, 1985; Tabachnick and Fidell, 2001). Multicollinearity arises when two or more independent variables in the regression model are correlated. While a small degree of multicollinearity may occasionally pose issues, moderate to high levels can significantly impact the analysis and must be addressed (Daoud, 2017). The absence of autocorrelation is another essential aspect of a reliable model. Autocorrelation typically emerges in stock prices, where the current price is dependent on the preceding price. Autocorrelation occurs when the residuals are not independent from each other

(Getis, 2007). By thoroughly assessing these assumptions and addressing any violations, the research aims to ensure the robustness and reliability of the regression analysis and its findings. In this study, a value relevance approach is employed alongside multiple linear regression analysis to assess the impact of the independent variables (ROA, ROE, EPS and DPS) on the stock return of MBI10 companies. Value relevance refers to the extent to which financial information influences stock prices, determined by the strength of the correlation between the financial information and stock prices (Barth et al., 2001). A high correlation with market data signifies greater value relevance, indicating that accounting data aligns closely with market prices or returns (Filip and Raffournier, 2010). To evaluate the value relevance, calculating the coefficient of determination (R^2) for each independent variable in the regression model was a crucial step. This R^2 value indicates the proportion of variance in the dependent variable (Stock Return) that can be explained by the independent variable. According to Barth et al. (2001), a high R^2 value signifies a strong influence of the independent variable on the dependent variable, highlighting its value relevance.

4. RESULTS AND DISCUSSION

Prior to presenting the regression model results, an analysis was conducted to examine the relationship between the stock returns of MBI10 and the independent variables (ROA, ROE, EPS, and DPS). The assumptions for multiple linear regression were tested to ensure their validity and appropriateness. The first assumption tested was the linearity assumption between the dependent variable (Stock return) and the independent variables (ROA, ROE, EPS, and DPS). Chart 1 illustrates the results of this analysis, showing the presence of linearity between the variables. Nearly all data points in Chart 1 align closely with the straight line, indicating a clear linear relationship between the variables.

Chart 1: Linearity



(Source: Author's elaboration)

Furthermore, a normality test was performed, i.e. testing the assumption of a normal distribution of the residuals of the dependent variable (the stock return). This assumption is checked with Kolmogorov-Smirnov and Shapiro-Wilk tests in SPSS, and the results are shown in Table 2.

Table 2: Tests of Normality

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Stock_Return	.176	70	.000	.871	70	.000
Stock_Return (Sqrt)	.100	70	.079	.971	70	.109

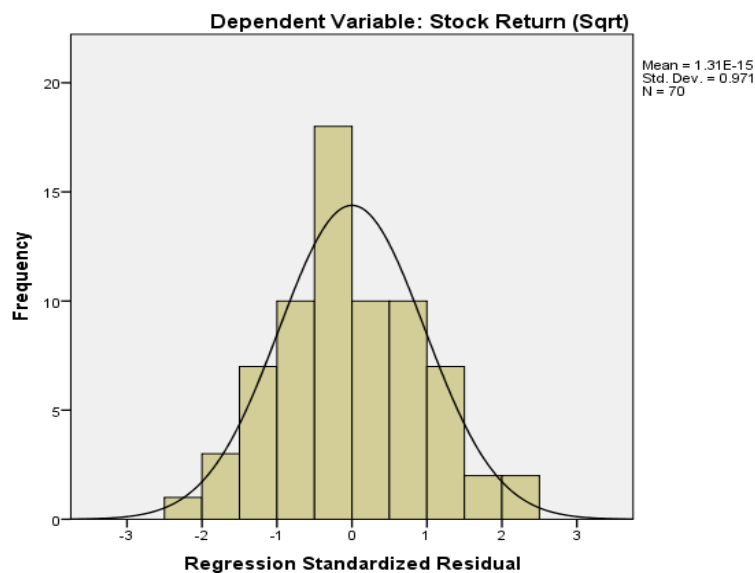
(Source: Author's elaboration)

Upon analyzing Table 2, it becomes evident that the initial examination of the normality assumption for the dependent variable (Stock return) indicated a lack of normal distribution in the residuals. This was confirmed by both tests, where the p-values were below 0.05, signifying a statistically significant deviation from normality. To address this issue and meet the assumption, the dependent variable was transformed using the Square root (Sqrt) function in SPSS.

Following the transformation, it can be observed that the dependent variable now satisfies the requirement of normal distribution for further regression model testing. This is evident from the Kolmogorov-Smirnov (0.079) and Shapiro-Wilk (0.109) tests, both of which yield values greater than 0.05 as shown in Table 2. These results indicate that the transformed dependent variable (Stock return (Sqrt)) adheres to the assumption of normality, signifying that the deviation of its distribution from the normal distribution is not statistically significant.

The fulfillment of the normality assumption is also visually apparent in the graphical representation. Chart 2 displays the distribution of the dependent variable, demonstrating that its residuals exhibit a normal distribution pattern.

Chart 2: Distribution of Stock return (Sqrt)



(Source: Author's elaboration)

Table 3 presents the results of the collinearity test, which helps determine whether there is multicollinearity among the independent variables. In order to satisfy the condition of absence of multicollinearity, the Variance Inflation Factor (VIF) should be below 10 (O'Brien, 2007). By

examining the collinearity statistics in the test, we can conclude that there is no multicollinearity, indicating that there is no significant correlation between the independent variables. This conclusion is supported by the VIF values, which are all less than 10.

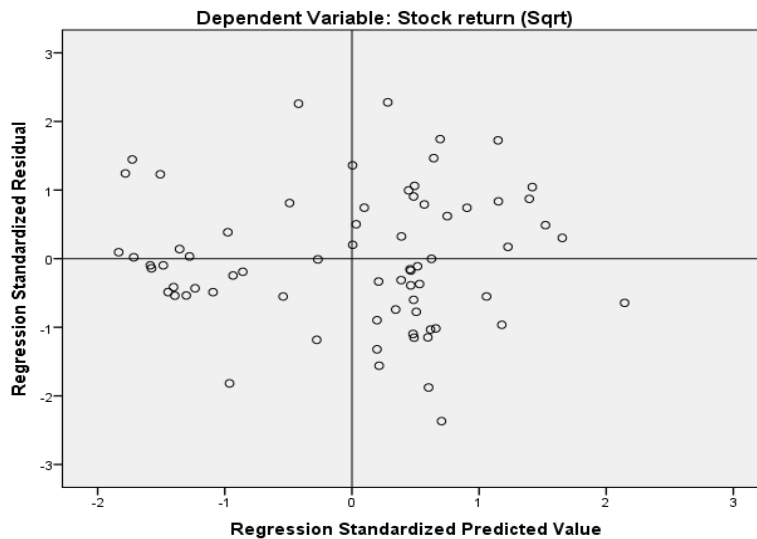
Table 3: Collinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	EPS	.248	4.036
	DPS	.319	3.133
	ROA	.621	1.610
	ROE	.641	1.560

(Source: Author's elaboration)

The visual representation of Chart 3 supports the assumption of homoscedasticity. It is evident that the data points are evenly distributed around zero, indicating a relatively consistent variance of errors across all levels of the independent variables. Therefore, we can infer that heteroscedasticity is not present in the data.

Chart 3: Scatter Plot



(Source: Author's elaboration)

To validate this finding, further examination was conducted by performing an analysis of variance (ANOVA) on the residuals. The outcomes of this test can be observed in Table 4, revealing that the p-value (Sig.) is 0.124, which exceeds the significance level of 0.05. Hence, based on these results, we can conclude that no heteroskedasticity is present.

Table 4: ANOVA of the residuals

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.309	4	.077	1.881	.124
Residual	2.669	65	.041		
Total	2.978	69			

(Source: Author's elaboration)

Autocorrelation was examined as the final assumption using the Durbin-Watson test. The test yielded a value of 2.100, which is above the significance level of 0.05 (Table 5). Based on this result, it can be inferred that there is no evidence of autocorrelation present in the data.

Table 5: Durbin-Watson test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.322	.104	.049	.20265	2.100

(Source: Author's elaboration)

Once the necessary tests have confirmed that the assumptions for a valid and trustworthy regression model are satisfied, the next step involves executing the model to examine the potential influence of the independent variables on the dependent variable.

The results of the multiple linear regression model, are presented in the Table 6a.

Table 6a: Multiple Linear Regression Model – Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	.463	.059		7.885	.000
EPS	4.366	.000	.454	1.926	.045
DPS	.000	.000	.281	1.353	.181
ROA	2.212	.937	.352	2.360	.021
ROE	.412	.526	.115	.782	.437

(Source: Author's elaboration)

Regarding H1, which posited a significant positive relationship between ROA and Stock Return, the regression analysis yielded a coefficient of 2.212 (Beta = 0.352, p = 0.021). The positive coefficient suggests that an increase in ROA is associated with a corresponding increase in Stock Return. Moreover, the p-value of 0.021 indicates that the relationship is statistically significant at the 5% level, supporting the acceptance of H1. This result builds on the study of Bintara and Tanjung (2019), who, investigating the Kompas 100 index listed on the Indonesia Stock Exchange (IDX), conclude that ROA has a positive effect on stock returns. Similarly, for H2, which proposed a significant positive relationship between ROE and Stock Return, the regression coefficient was found to be 0.412 (Beta = 0.115, p = 0.437). The positive coefficient suggests a positive association between ROE and Stock Return, but the p-value of 0.437

indicates that the relationship lacks statistical significance. Thus, H2 is not supported by the results. This result is contrary to the conclusions of most previous research, which concluded that ROE affects stock returns (Clubb and Naffi, 2007; Haghiri and Haghiri, 2012; Al-Lozi and Obeidat, 2016). In the case of H3, which assumed a significant positive relationship between EPS and Stock Return, the regression coefficient was 4.366 (Beta = 0.454, p = 0.045). The positive coefficient and the statistically significant p-value (0.045) indicate a strong and positive impact of EPS on Stock Return, supporting the acceptance of H3. This conclusion corresponds with the result in the study of Al-Lozi and Obeidat (2016) who, investigating 65 manufacturing companies listed in Amman Stock Exchange, conclude that EPS have a significant relationship with stock return. Lastly, H4 proposed a significant positive relationship between DPS and Stock Return. However, the regression coefficient for DPS was 0.000 (Beta = 0.281, p = 0.181), and the p-value of 0.181 suggests that the relationship is not statistically significant. Therefore, the results do not support H4. This result is contrary to the conclusions of most previous research, such as the study of Ebrahimi and Chadegani (2011), whose results show a relationship between DPS and stock returns. Shortly, the multiple linear regression analysis indicates that ROA and EPS have a statistically significant positive impact on Stock Return, supporting H1 and H3. On the other hand, the results do not provide sufficient evidence to support the significance of the relationships between ROE, DPS, and Stock Return (H2 and H4). These findings provide valuable insights into the influence of financial performance indicators on Stock Return, enabling a better understanding of the factors affecting stock prices in the context of the MBI10 companies in North Macedonia.

The results of the robustness check (Table 6b), where the regression model includes the two control variables, Macedonian GDP annual real growth rates and DAX30 Index annual rate of return, have provided valuable insights into the relationship between financial performance indicators and the stock return of MBI10 companies in North Macedonia. Interestingly, the findings from this extended model align closely with the initial regression model, which considered only the financial performance indicators (EPS and ROA) as independent variables.

Table 6b: Multiple Linear Regression Model – Coefficients (Including the control variables)

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	
	B	Std. Error	Beta			
1	(Constant)	.451	.067		6.739	.000
	EPS	4.315	.000	.449	1.902	.042
	DPS	.000	.000	.281	1.358	.179
	ROA	2.259	.939	.359	2.405	.019
	ROE	.478	.526	.133	.909	.367
	GDP	.927	1.226	.090	.756	.453
	DAX30	.277	.184	.179	1.509	.136

(Source: Author's elaboration)

In both models, the multiple linear regression analysis revealed that only EPS and ROA had a statistically significant and positive impact on the stock return of MBI10 companies. This consistency in the results signifies the robustness and reliability of the relationships observed

between these financial performance indicators and stock returns, as they hold true even when accounting for external economic and market factors. Interestingly, the control variables, Macedonian GDP annual real growth rates, and DAX30 Index annual rate of return, did not exhibit statistically significant relationships with stock return in either regression model. This lack of significance suggests that, in the context of the MBI10 companies in North Macedonia, the stock returns are primarily influenced by internal financial performance indicators (EPS and ROA) rather than external economic and market conditions. The consistent results between the two regression models provide robust evidence that EPS and ROA are key determinants of stock return for the MBI10 companies, regardless of fluctuations in the country's GDP growth rates or changes in the DAX30 Index performance. This indicates that investors place significant emphasis on the financial performance and profitability of the individual companies when making investment decisions, outweighing the impact of broader economic and market factors.

Table 7a: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.322	.104	.049	.20265

(Source: Author's elaboration)

The strength of the influence of the independent variables on the dependent variable is determined using the coefficient of determination (Adjusted R Square), which ranges from 0 to 1, so the closer it is to 1, the stronger the relationship. Interpreting the Adjusted R Square rather than the R Square is preferable in this context because the Adjusted R Square considers the number of independent variables in the model, providing a more accurate representation of the proportion of variance in the dependent variable (Stock Return) that can be explained by the selected independent variables. In our analysis, the calculated Adjusted R Square value is 0.049 (as shown in Table 7a), indicating that the regression relationship is not particularly strong. To put it into perspective, the Adjusted R Square value of 0.049 implies that only 4.9% of the changes observed in the Stock Return can be attributed to the influence of the independent variables (ROA, ROE, EPS, and DPS) considered in the study. In contrast, the remaining 95.1% of the changes in the Stock Return are influenced by other factors that were not included in the model. Therefore, based on the obtained Adjusted R Square value, we can infer that the financial performance indicators (ROA, ROE, EPS, and DPS) examined in the research have a limited explanatory power when it comes to predicting the variations in Stock Return. These results suggest that there are likely other crucial factors beyond the scope of this study that play a more dominant role in determining the fluctuations in Stock Return among the MBI10 companies in North Macedonia. It is essential to acknowledge the limitations highlighted by the modest Adjusted R Square value and consider them when interpreting the research outcomes.

In the extended regression model, which includes the two control variables, the Adjusted R square is calculated to be 0.058 (Table 7b). This indicates that approximately 5.8% of the variance in the stock return of MBI10 companies can be explained by the combined influence of the financial performance indicators (EPS and ROA) and the control variables (Macedonian GDP annual real growth rates and DAX30 Index annual rate of return). The model's ability to explain a slightly higher proportion of the variance compared to the initial model without the control variables suggests that the addition of these external factors has a marginal impact on the overall explanatory power of the model. The financial performance indicators, specifically EPS

and ROA, continue to show statistically significant and positive impacts on the stock return of MBI10 companies, while the control variables do not contribute significantly to the model's explanatory power.

Table 7b: Model Summary (Including the control variables)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.374	.140	.058	.20169

(Source: Author's elaboration)

These findings underscore the importance of financial performance and profitability as key determinants of stock return in the Macedonian market and emphasize the need for investors and policymakers to focus on the internal financial health of companies when making investment decisions or formulating economic policies. Furthermore, the modest Adjusted R square values in both models highlight the complexity of stock market dynamics and the presence of various other factors that influence stock returns, warranting further exploration and research in this area. The results of this study offer valuable implications for investors and policymakers alike. For investors, the findings underscore the importance of analyzing a company's financial performance indicators, particularly EPS and ROA, to make informed investment decisions. Companies with strong earnings and efficient asset utilization are more likely to generate higher returns for investors, making them attractive investment opportunities. For policymakers, the results emphasize the significance of fostering an environment that promotes strong financial performance and profitability for companies operating in North Macedonia. Policies and regulations that support transparency, accountability, and financial sustainability are crucial for attracting investment and fostering economic growth. It is essential to acknowledge some limitations of this research. Despite the robustness of the results, the study focused on a specific set of financial performance indicators and control variables. There may be other relevant factors not considered in this analysis that could also influence stock returns. Additionally, the study is based on data from a particular period, and the results may vary in different market conditions or timeframes.

5. CONCLUSION

This paper sought to explore the relationship between financial performance indicators and annual stock returns of the MBI10 companies in North Macedonia over a ten-year period from 2013 to 2022. Through an empirical study utilizing multiple linear regression analysis, the impact of key financial indicators, including Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and Dividend per Share (DPS), on annual stock returns was investigated. Additionally, a robustness check was performed to assess the stability and consistency of the findings, while two control variables: Macedonian GDP annual real growth rates and DAX30 Index annual rate of return, were introduced to enhance the reliability of the results. The research aimed to provide valuable insights into the factors influencing stock prices in the Macedonian market and their implications for investors, analysts, and policymakers. The results of the multiple linear regression analysis revealed varying degrees of influence of the financial performance indicators on stock returns. Specifically, Return on Assets (ROA) and Earnings per Share (EPS) were found to have a statistically significant positive impact on annual

stock returns. This implies that companies with higher ROA and EPS values tend to generate higher stock returns, making them more attractive to investors. On the other hand, Return on Equity (ROE) and Dividend per Share (DPS) did not demonstrate a statistically significant relationship with annual stock returns, indicating that these financial indicators may not be strong predictors of stock price movements in the Macedonian market. To enhance the reliability and validity of the results, a robustness check was conducted by introducing two control variables: Macedonian GDP annual real growth rates and DAX30 Index annual rate of return. The inclusion of these control variables did not alter the main findings of the study, as the regression model with the control variables showed the same results as the model without them. This reaffirms the robustness and consistency of the relationships between ROA and EPS with stock returns. Moreover, the model with the control variables demonstrated a slightly higher Adjusted R Square value (0.058) compared to the model without them (0.049), indicating a slight improvement in the explanatory power. The control variables may have contributed to capturing some of the unexplained variance in the stock returns, leading to the increased Adjusted R Square value. The findings emphasize the importance of considering multiple financial performance indicators when assessing a company's potential to generate returns for shareholders. ROA reflects the efficiency of a company in generating profits from its assets, while EPS provides insights into the profitability allocated to each outstanding share. These two indicators can serve as valuable metrics for investors in assessing a company's overall performance and its ability to deliver attractive returns. Thus, investors and analysts in the Macedonian market should pay close attention to companies with robust ROA and EPS values as potential investment opportunities. However, the limited explanatory power of the financial performance indicators (as indicated by the modest Adjusted R Square value) suggests that there are other critical factors beyond the scope of this study that significantly influence stock returns in the Macedonian market. The complexity of stock market dynamics demands a comprehensive examination of various economic, political, and market-specific factors that could contribute to stock price movements. Therefore, future research should delve deeper into the exploration of additional factors that may play a more dominant role in determining stock returns in North Macedonia. The empirical study offers insights into the value relevance of accounting information in the Macedonian market. The positive relationship between financial performance indicators (ROA and EPS) and annual stock returns indicates that accounting data does indeed hold value relevance, influencing market prices and returns. This finding aligns with prior research and underlines the importance of financial statements as essential sources of information for investors in emerging markets like North Macedonia. In such markets, where other sources of information may be limited, financial statements play a crucial role in guiding investment decisions. Furthermore, the research contributes to the understanding of stock market efficiency and investment strategies in the Macedonian context. Investors seeking to maximize returns may consider focusing on companies with higher ROA and EPS values, as these companies have demonstrated a greater potential for delivering attractive stock returns. The research also highlights the potential benefits of diversification, as investors can spread their risk across multiple companies and industries to capture a wide range of opportunities in the market. From a policy perspective, the findings may be relevant for regulators and policymakers in North Macedonia who seek to promote transparency, efficiency, and investor confidence in the financial markets. Strengthening financial reporting standards, improving the accessibility of financial information, and fostering a robust investment environment are critical steps that can enhance market efficiency and attract more domestic and international investors. The integration

of rigorous methodology, robustness checks, and comprehensive analysis strengthens the reliability of the study's findings and establishes a foundation for further advancements in this field.

REFERENCES

- Alaagam, A. (2019). The relationship between profitability and stock prices: Evidence from the Saudi Banking Sector. *Research Journal of Finance and Accounting*, 10(14).
- Ali, A., and Hwang, L. S. (2000). Country-specific factors related to financial reporting and the value relevance of accounting data. *Journal of Accounting Research*, 38, 1–21.
- Al-Lozi, N. M., and Obeidat, G. S. (2016). The relationship between the stock return and financial indicators (profitability, leverage): An empirical study on manufacturing companies listed in Amman Stock Exchange. *Journal of Social Sciences (CoesandRj-Jss)*, 5(3), 408-424.
- Avdalović, M. S. and Milenković, I. (2017) Impact of company performances on the stock price: An empirical analysis on select companies in Serbia, *Ekonomika poljoprivrede*, 64(2), 561-570, <https://doi.org/10.5937/ekoPolj1702561M>
- Baker, H. K., and Powell, G. E. (2000). Determinants of corporate dividend policy: a survey of NYSE firms. *Financial Practice and education*, 10, 29-40.
- Ball, R., Kothari, S. P., and Robin, A. (2000). The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics*, 29, 1–51.
- Barth, M. E., Beaver, W. H., and Landsman, W. R. (2001). The relevance of the value relevance literature for financial accounting standard setting: another view. *Journal of accounting and economics*, 31(1-3), 77-104.
- Berry, W. D., and Feldman, S. (1985). *Multiple Regression in Practice*. Sage University Paper Series on Quantitative Applications in the Social Sciences, series no. 07-050. Newbury Park, CA: Sage.
- Bintara, R., Tanjung P. R. S. (2019). Analysis of Fundamental Factors on Stock Return. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 9 (2), 49-64. <http://dx.doi.org/10.6007/IJARAFMS/v9-i2/6029>
- Borges, M. R., 2010. Efficient market hypothesis in European stock markets. *The European Journal of Finance*, 16(7), 711-726. <https://doi.org/10.1080/1351847X.2010.495477>
- Choiriyah, C., Fatimah, F., Agustina, S. and Ulfa, U., 2020. The Effect Of Return On Assets, Return On Equity, Net Profit Margin, Earning Per Share, And Operating Profit Margin On Stock Prices Of Banking Companies In Indonesia Stock Exchange. *International Journal of Finance Research*, 1(2), 103-123. <https://doi.org/10.47747/ijfr.v1i2.280>
- Claudia, A., and Indrati, M. (2021). Analysis of Effect on Asset Return, Return on Equity, Earning Per Share, and Net Profit Margin on Stock price on Banking Company. *Journal Research of Social, Science, Economics, and Management*, 1(2), 64–78. <https://doi.org/10.36418/jrssem.v1i2.10>
- Clubb, C., and Naffi, M. (2007). The usefulness of book-to-market and ROE expectations for explaining UK stock returns. *Journal of Business Finance and Accounting*, 34(1-2), 1-32. doi: 10.1111/j.1468-5957.2006.00662.x
- Dang, H. N., Nguyen, T. T. C., and Tran, D. M. (2020). The impact of earnings quality on firm value: The case of Vietnam. *The Journal of Asian Finance, Economics and Business*, 7(3), 63-72.

- Daoud I., J., 2017. Multicollinearity and Regression Analysis. *Journal of Physics: Conference Series*, p. 949.
- Ebrahimi, M., and Aghaei Chadegani, A. (2011). The relationship between earning, dividend, stock price and stock return: evidence from Iranian companies. In *International Conference on Humanities, Society and Culture, IPEDR*, 20. IACSIT Press, Singapore
- Filip, A., and Raffournier, B. (2010). The value relevance of earnings in a transition economy: The case of Romania. *The International Journal of Accounting*, 45(1), 77-103.
- Garba, A. (2014). Impact of Dividend-Per-Share on Common Stock Returns: A Case Study of Some Selected Manufacturing Firms Listed on the Nigeria Stock Exchange. *European Journal of Business and Management*, 6(30).
- Getis, A., 2007. Reflections on spatial autocorrelation. *Regional Science an Urban Economics*, 37(4), 491-496. <https://doi.org/10.1016/j.regsciurbeco.2007.04.005>
- Gharaibeh, A. T., Saleh, M. H., Jawabreh, O., and Ali, B. J. (2022). An empirical study of the relationship between earnings per share, net income, and stock price. *Appl. Math*, 16(5), 673-679.
- Haghiri, A., and Haghiri, S. (2012). The investigation of effective factors on stock return with emphasis on ROA and ROE ratios in Tehran stock exchange (TSE). *Journal of Basic and Applied Scientific Research*, 2(9), 9097-9103.
- Hayes, A., 2022. Dividend Signaling: Definition, Theory, Research, and Examples. [Online] Available at: <https://www.investopedia.com/terms/d/dividendsignaling.asp> [Accessed 24 August 2023].
- Indraswono, C. (2021). Traditional and Modern Analysis Performance Indicators: Evidence from New York Stock Exchange. *KINERJA*, 25(1), 64-78.
- Jindrichovska, I. (2001). The relationship between accounting numbers and returns: Some empirical evidence from the emerging market of the Czech Republic. *The European Accounting Review*, 10, 107–131.
- Kopecká, N. (2018). A literature review of financial performance measures and value relevance. In *The Impact of Globalization on International Finance and Accounting: 18th Annual Conference on Finance and Accounting (ACFA)*, 385-393. Springer International Publishing.
- Krishnan, J. and Krishnan, J., 2016. The Role of Economic Trade-Offs in the Audit Opinion Decision: An Empirical Analysis. *Journal of Accounting, Auditing and Finance*, 11(4), 565–586. <https://doi.org/10.1177/0148558X9601100403>
- Ligocká, M., and Stavárek, D. (2019). The relationship between financial ratios and the stock prices of selected European food companies listed on stock exchanges. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 67(1), 299-307.
- Musallam, S. R. (2018). Exploring the relationship between financial ratios and market stock returns. *Eurasian Journal of Business and Economics*, 11(21), 101-116.
- O'Brien, R. M., (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality and Quantity*, 41, 673–690.
- Osborne, J. W. and Waters, E., 2002. Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research, and Evaluation*, 8(2). <https://doi.org/10.7275/r222-hv23>
- Parlakkaya, R. and Kahraman, Ü. M. (2017). Muhasebe Bilgilerinin Hisse Fiyatlarını Açıklama Düzeyi Üzerine Bir Araştırma: Bist100 Uygulaması, Selçuk Üniversitesi İktisadi ve İdari Bilimler Fakültesi Sosyal Ekonomik Araştırmalar Dergisi, 17(33), 46-58

- Tabachnick, B. G., Fidell, L. S. (2001). *Using Multiple Statistics* (4th ed.). Needham Heights, MA: Allyn and Bacon.
- Tsipouridou, M. and Spathis, C., (2014). Audit opinion and earnings management: Evidence from Greece. *Accounting Forum*, 38(1), 38-54.
<https://doi.org/10.1016/j.accfor.2013.09.002>