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The Role of Financial Ratios in Predicting Stock Returns: An Application of Generalized Method of Moments in Borsa Istanbul

Hisse Senedi Getirilerinin Tahmininde Finansal Oranların Rolü: Borsa İstanbul'da Genelleştirilmiş Momentler Yöntemi Uygulaması

Gökhan Berk Özbek [a,*] & Ümit Hasan Gözkonan [b]

[a] Öğr. Gör. Dr., Bursa Uludağ University, Harmancık Meslek Yüksekokulu, Muhasebe ve Vergi Uygulamaları Bölümü, 16770, Bursa / Türkiye
ORCID: 0000-0003-0288-069X
[b] Öğr. Gör. Dr., Manisa Celal Bayar University, Rektörlük, 45140, Manisa / Türkiye
ORCID: 0000-0002-7187-6304

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ÖZ

Tasarruf sahiplerinin yatırım kararlarına şekil veren başlıca unsurlardan biri şirketlerin finansal rasyolarıdır. Nitekim finansal piyasaların etkinliği ve şirketlere ilişkin mali verilerin şirketlerin hisse performansları üzerindeki etkileri finansal literatürde her daim ilgi gören araştırma konularından biri olmuştur. Bu çalışmada Borsa İstanbul'da listelenen ve sanayi sektöründe faaliyet gösteren, piyasa değeri bakımından başlıca on şirketin finansal rasyolarının hisse senedi performansları üzerindeki etkileri araştırılmıştır. Şirketlerin son on çeyreklik verileri araştırmaya dahil edilmiş ve araştırma yöntemi olarak Genelleştirilmiş Momentler Metodu (GMM) tabanlı Dinamik Panel Yaklaşımı uygulanmıştır. Araştırma modelinde Aktif Karlılık Oranı (ROA), Özsermaye Karlılık Oranı (ROE), Yatırım Yapılan Sermaye Getirisi (ROIC), Borç/Özsermaye Oranı (D/E) ve Likit Oran (QR) bağımsız değişkenler olarak; hisse senedi getirisi ise bağımlı değişken olarak tanımlanmıştır. Çalışma sonucunda ROA ve D/E rasyolarının hisse senedi getirisi üzerinde negatif yönlü, ROE rasyosunun ise pozitif yönlü bir etkisi olduğu tespit edilmiştir.

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ABSTRACT

One of the main factors shaping the investment decisions of savers is the financial ratios of companies. Indeed, the efficiency of financial markets and the effect of financial data related to companies on their stock performance have always been subjects of interest in the financial literature. This study investigates the effects of the financial ratios of the top ten companies listed on Borsa Istanbul that operate in the industrial sector on their stock performance. The recent ten quarters of data from the companies were included in the research, and the Generalized Method of Moments (GMM)-based Dynamic Panel Approach was applied as the research method. In the research model, Return on Assets (ROA), Return on Equity (ROE), Return on Invested Capital (ROIC), Debt/Equity Ratio (D/E), and Quick Ratio (QR) were defined as independent variables, while stock return was defined as the dependent variable. As a result of the study, it was determined that the ROA and D/E ratios have a negative effect on stock returns, while the ROE ratio has a positive effect.

* *Sorumlu yazar/Corresponding author.*
e-posta: *gbozbek@uludag.edu.tr*

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1. Introduction

Financial ratios have long been recognized as essential tools in assessing a company's performance. These ratios, derived from financial statements. Over the years, various financial ratios have been used to predict stock returns, helping investors make informed decisions. Research has consistently shown that financial ratios, such as Return on Equity (ROE) and Return on Assets (ROA), provide valuable insights into a company's potential to generate profits and create shareholder value.

In emerging markets like Türkiye, financial ratios play a crucial role in guiding investment strategies, especially given the volatility and rapid changes in market conditions. The industrial sector, in particular, is a key driver of economic growth, making it an important focus for investors looking to capitalize on stock market opportunities. While financial ratios have been widely studied in developed markets, their applicability and predictive power in emerging markets, such as the Istanbul Stock Exchange, require further investigation. Understanding how financial ratios impact stock returns in this context is essential for investors aiming to mitigate risks and optimize returns.

Financial markets offer various analytical tools to help investors forecast future returns by evaluating a company's financial performance. One of the key methods used for this purpose is financial ratio analysis, which assesses a company's historical performance and current standing through the use of ratios that measure various financial indicators. These financial ratios are crucial in investment decision-making as they provide insights into a company's operations, liquidity, profitability, and debt-paying capacity. Particularly in stock investments, financial ratios are widely accepted as valuable guides in helping investors make informed decisions.

The linkage between financial ratios and stock returns has been a central topic in financial research due to its significant relevance for investors, policymakers, and corporate executives. Financial ratios, which are calculated from a company's financial reports, offer valuable insights into different dimensions of its performance, such as profitability, liquidity, and solvency. These ratios are frequently employed to forecast stock returns, reflecting the profits or losses from an investment in a company's stock over time.

The main goal for investors when buying company stocks is to increase their wealth, which is accomplished through stock market returns. Stock market returns play a key role in determining the best investment opportunities. In order to select an investment that offers high returns with minimal risk, investors require detailed information about a company's financial condition and performance. As Anwaar (2016) points out, financial data is a critical resource for investors when deciding to invest in a company. Emamgholipour et al. (2013) highlight that company information can be divided into internal and external categories. Internal information consists of financial documents such as the balance sheet, cash flow statement, and income statement, while external information comes from stock market data. Both types of information impact investor decisions related to stock returns.

Financial ratio analysis provides a means to assess a company's financial performance across different time frames or relative to its competitors. These ratios are essential for conducting trend analysis, which tracks changes in performance over time, and comparative analysis, which evaluates the company's position against industry peers. The data needed to calculate financial ratios is typically derived from key financial documents, including balance sheets, income statements, and cash flow statements, all prepared according to accounting standards such as IFRS or GAAP. Thus, financial ratios enhance other financial analysis methods. The main categories of financial ratios are profitability, liquidity, leverage, efficiency, and market valuation ratios.

The influence of financial ratios on stock returns can vary significantly depending on the sector and market in which a company operates. For instance, the industrial sector, characterized by capital-intensive operations and sensitivity to economic cycles, presents unique challenges and opportunities for investors. In such a sector, financial ratios like ROA and Debt-to-Equity (D/E) ratio can reveal critical insights into a firm's efficiency and financial stability. The ROA ratio highlights how effectively a company is utilizing its assets to generate profits, which is especially important in industries where high levels of capital investment are necessary. Similarly, the D/E ratio reflects the firm's reliance on debt to finance its growth, with potential implications for both risk and return. Investors and analysts closely monitor these ratios to assess the risk-return profile of industrial companies. This study, by focusing on the industrial sector of Borsa Istanbul, aims to provide deeper insights into how such financial ratios influence stock returns, helping investors tailor their strategies to the specific dynamics of this sector.

Previous studies have examined the linkage between financial ratios and stock performance has garnered increased attention. Piotroski (2000) investigated how financial ratios can be applied to enhance stock selection, particularly for value stocks, highlighting their role in improving portfolio returns. Fama and French (1992) argued that specific ratios, such as the book-to-market ratio, are crucial for explaining stock returns and identifying risk factors. Penman and Reggiani (2013) emphasized that ROE and profit margins are critical indicators of a firm's future stock performance. Additionally, Lev and Thiagarajan (1993) focus on the predictive power of earnings quality and financial signals in forecasting stock returns, suggesting that high-quality earnings often lead to superior stock performance.

Key financial metrics such as profitability ratios, debt ratios, liquidity, and market performance can have a substantial impact

on stock returns. In this regard, the impact of financial ratios on stock returns of companies operating in different sector, particularly in the industrial sector of Borsa Istanbul, remains underexplored. This study aims to fill this gap by analyzing how key financial ratios affect stock returns in industrial sector of Türkiye, providing insights for both investors and policymakers.

2. Literature Review and Theoretical Framework

2.1. Literature Review

The linkage between financial ratios and stock returns has been the subject of extensive research, with various studies examining different financial ratios to determine their predictive power on stock returns. This literature review synthesizes findings from multiple studies to provide a comprehensive understanding of how financial ratios impact stock returns.

Östarmark and Aaltonen (1995) used the LISREL model to explore the causal link between financial statement data and market performance, finding that accrual information could predict future market reactions. They noted significant connections between accruals, cash flows, and market risk, and emphasized the need to account for firm size variations when analyzing financial ratios.

Aktaş (2008) analyzed the linkage between financial ratios and stock returns on the Istanbul Stock Exchange, focusing on medium-term analysis to inform investment strategies for pension and insurance funds. Key ratios identified were the acid test ratio and cash flows to equity for 1995-1999, and gross and net profit margins for 2003-2006, highlighting their importance in effective stock investment strategies.

Karaca and Başcı (2011) used panel data analysis to examine factors influencing stock performance for ISE 30 companies from 2001 to 2009. The study found that financial ratios such as operating profit margin, net profit margin, asset turnover, and equity turnover significantly impacted stock returns. Net profit and operating profit margins positively affected stock returns, while asset and equity turnover ratios also played important roles, highlighting the importance of profitability and efficiency ratios in predicting stock performance.

Aydemir, Ögel, and Demirtaş (2012) examined the influence of financial ratios on stock prices for Borsa Istanbul-listed manufacturing companies from 1990 to 2009. Their panel data analysis revealed that profitability, liquidity, and leverage ratios positively affected stock returns, while activity ratios had no significant impact. The study concluded that financial ratios contribute to explaining stock prices, but their overall effect on stock returns is limited.

Karcıoğlu and Özer (2014) analyzed factors influencing stock returns for 113 manufacturing companies listed on Borsa Istanbul from 2002 to 2011, using static and dynamic panel data analysis. They found significant relationships between stock returns and factors such as the acid-test ratio, beta, firm size, gross profit margin, current ratio, debt-to-equity ratio, exchange rates, interest rates, and money supply. However, variables like return on assets, dividend per share, gold prices, and foreign portfolio investments showed no significant impact. The study highlighted the role of both firm-specific and macroeconomic factors in shaping stock returns within the manufacturing sector in Türkiye.

Güngör and Yerdelen Kaygın (2015) used dynamic panel data analysis to identify factors affecting stock prices, examining both microeconomic and macroeconomic elements. The microeconomic factors, based on quarterly financial reports of Borsa Istanbul manufacturing firms (2005-2011), included liquidity, profitability, activity, leverage, and market performance ratios. Macroeconomic factors included exchange rates, inflation, money supply, interest rates, and GDP. The analysis highlighted the significance of these factors in influencing stock prices, offering valuable insights for investors, researchers, and managers.

Wijesundera et al. (2015) explored the predictive power of financial ratios on stock returns for 60 companies traded on the Colombo Stock Exchange between 2004 and 2013. The study concentrated on key indicators, including P/E, ROE, EPS, DY, and MV/BV ratios. Their findings showed that EPS, ROE, and MV/BV were positively correlated with stock returns, whereas DY had a negative influence.

Güriş and Pala (2016) analyzed the link between stock returns and firm characteristics on Borsa Istanbul (BIST), using an asset pricing model. The study examined 50 industrial firms listed on the BIST-100 index from 2005 to 2013, using 26 financial ratios, later narrowed to five key factors through factor analysis. Panel data analysis revealed that, in addition to BIST-100 returns, the price-to-earnings ratio and operating profit margin had a significant positive impact on stock returns. These findings emphasized the role of firm-specific factors in stock performance, consistent with previous research.

Sevim (2016) examined the linkage between financial ratios and stock returns for manufacturing firms listed on the BIST 100 index from 2001 to 2014. Using panel data analysis, they find that key financial ratios, such as the Stock Turnover Ratio (SDH), Accounts Receivable Turnover Ratio (ADH), Fixed Asset Turnover Ratio (DRVHD), and Short-Term Debt to Total Debt Ratio (KVBTB), have a statistically significant impact on stock returns. The study concluded that these financial ratios are essential indicators for investors assessing stock performance in the Turkish market.

Acaravcı (2016) examined the linkage between financial ratios and stock returns for Borsa Istanbul firms, focusing on the shift from local accounting standards (TDHP) to International Financial Reporting Standards (IFRS). Using data from 43 manufacturing

firms, the study compared the TDHP period (1996-2004) with the IFRS period (2005-2014) through panel data regression. The results showed that IFRS-based financial ratios had a stronger predictive power for stock returns than TDHP ratios. During the TDHP period, only profitability and market performance ratios were significant, while in the IFRS period, multiple ratios, including current ratio, cash ratio, leverage, and return on equity, were influential. The study suggests IFRS improved the usefulness of financial information for investors.

Kurt and Köse (2017) used the Panel Granger causality test to examine the linkage between financial ratios and stock returns for nine banks listed on Borsa Istanbul from 2002Q4 to 2016Q2. Of the 32 financial ratios analyzed, two-(Shareholders' Equity - Fixed Assets) / Total Assets and Turkish Loans and Receivables / Total Loans and Receivables-were significant predictors of bank stock returns. These findings highlight the predictive value of certain financial ratios for bank stock performance, offering useful insights for investors.

Cengiz and Püskül (2017) examined the link between stock returns and profitability for companies listed on Borsa Istanbul. Analyzing data from 2011 to 2015 using panel data, they found that equity profitability and gross sales margin positively affected stock returns, while operating profitability had a negative impact. No significant relationship was found between net profit margin, asset profitability, and stock returns. The study concluded that profitability ratios can help estimate stock returns and assist investors in portfolio decisions.

Şenol, Koç, and Şenol (2018) used dynamic panel data analysis to study the factors affecting stock prices in Borsa Istanbul's Metal Goods, Machinery, and Equipment Maintenance sector from 2010Q1 to 2017Q1. They found that past stock prices, economic growth, return on assets, liquidity, and leverage ratios positively influenced stock prices, while Eurozone interest rates had a negative effect. The study underscores the importance of both macroeconomic and firm-specific factors in determining stock prices, offering insights for investors and managers.

Özgür (2019) analyzed the linkage between stock returns and financial ratios for 100 BIST Industrial Index companies from 2012 to 2017 using the Panel-ARDL model. The study found significant long-term relationships between stock returns and the current ratio (negative), asset turnover (positive), and net profit margin (positive). Short-term relationships were observed with the leverage ratio, asset turnover, and net profit margin. The study highlights the importance of considering both short- and long-term effects of financial ratios on stock returns, offering valuable insights for investors and analysts.

Işık (2019) examined the effect of financial ratios on stock returns for BIST 100 companies from 2010 to 2017 using panel data regression. The study focused on ratios related to stock market performance, financial structure, profitability, activity, and liquidity. The results showed that the market value-to-book value ratio, earnings per share, total debt ratio, and return on assets significantly influenced stock returns, offering valuable insights for investors in evaluating firm financial health and making investment decisions.

Banerjee (2019) studied the effect of financial ratios on stock returns for companies listed on the Dubai Financial Market and Abu Dhabi Stock Exchange in 2017. The findings show that Dividend Yield and ROE significantly predict stock returns, while EPS, PER, and DER do not.

Öztürk and Karabulut (2020) analyzed the impact of financial ratios on stock returns for technology and telecommunication companies listed on the Turkish National Stock Exchange (ISE). Using panel data from 11 firms over 32 quarters (2008-2016), they found that EPS and EBITDA Margin positively influenced stock returns, while Price-to-Sales had a negative effect. The Debt-to-Equity ratio showed no significant impact.

Awalakki and Hn (2021) analyzed the linkage between financial performance indicators and stock returns for companies on India's National Stock Exchange (NSE). Using data from 160 firms over 2010-2020, the study found that ROE and Market Value Added (MVA) positively and significantly impact stock returns, while other variables showed less consistent effects.

Say (2022) analyzed the linkage between financial ratios and stock returns for Borsa Istanbul-listed food companies from 2009 to 2019. Using multiple regression and correlation analyses, the study found that cash ratio, inventory turnover, asset turnover, and fixed asset turnover significantly impacted stock returns, emphasizing the importance of these metrics for food sector investors.

Şenel (2022) analyzed the impact of financial factors on the stock returns of deposit banks listed on Borsa Istanbul. Using dynamic panel data analysis, the author examined variables such as short-term debt, assets, operating profit, and interest income. The results showed that short-term debt negatively affects stock returns, while assets and operating profit have a positive impact. Interest income, however, was found to be insignificant.

Muktiadji and Pamungkas (2022) examined the impact of financial ratios on stock prices for banks listed on the Indonesia Stock Exchange. They analyzed key indicators like ROA, DER, PBV, and NPM using multiple regression. The results revealed that PBV positively and significantly affected stock prices, while ROA, DER, and NPM showed no significant influence. The study concluded that these ratios collectively influence stock prices, offering valuable insights for investors evaluating bank performance.

Adıgüzel (2023) analyzed the impact of financial ratios on stock prices for energy companies listed on Borsa Istanbul from 2002

to 2021 using panel data analysis. The study found significant relationships between stock prices and key financial ratios, such as leverage, return on equity, and price-to-book ratio, along with oil prices. These findings underscore the importance of these factors for investors in the energy sector.

Romantica and Jalaludin (2024) examined the influence of financial ratios and firm size on stock returns for nine property and real estate firms listed on the Indonesia Stock Exchange from 2018 to 2022. Through panel data regression analysis, they determined that ROA, DER, CR, and firm size did not significantly affect stock returns.

When the studies in the literature are considered as a whole, it is generally observed that profitability, operating profitability, and liquidity ratios have a positive impact on companies' stock values and returns. However, there are differing opinions regarding the effect of leverage ratios on stock value.

2.2. Theoretical Framework

Shareholder theory (see Friedman, 1962 for more details), which defines the primary goal of businesses as maximizing firm value and shareholder earnings, has gained significant traction, particularly since the 1950s. There are numerous factors that influence firm value (such as global developments, macroeconomic conditions, sector-specific news, trends in financial markets, and fluctuations in alternative investment instruments). One of the most prominent of these factors is the balance sheets and financial structures of companies. Ratio analysis plays a crucial role in the investment decisions of savers. According to the efficient markets hypothesis (see Fama, 1970 for more details), any publicly available new information or development is expected to be reflected in stock prices. In this regard, it is also expected that the financial statements shared publicly by companies will have a direct impact on stock prices.

The data presented in companies' financial statements provide valuable insights into the current state and future potential of these companies for both existing shareholders and potential investors. Theoretically, high profitability and efficiency ratios of companies are expected to boost investor confidence and positively impact stock prices. Similarly, companies with strong liquidity ratios are believed to perform well in meeting short-term obligations and maintaining sufficient cash flow for operational activities, which could enhance stock performance. Positive growth rates may signal a promising future for the company, leading to higher valuations of its shares. On the other hand, efficient leverage ratios are expected to positively affect the company's value when capital is used effectively. Additionally, in the context of Rational Expectations Hypothesis (see Muth, 1961 for more details), the influence of financial data on stock performance may be amplified and accelerated.

However, in recent decades, groundbreaking globalization and the rapid flow of information have contributed to the increasing influence of behavioral finance elements. In certain conditions, investors may deviate from rational decision-making and act emotionally. Notably, the FOMO (fear of missing out) effect can drive such emotional decisions among investors, potentially leading to speculative movements in certain stocks.

Furthermore, technical financial analysis has gained considerable popularity in recent years, sometimes taking precedence over ratio analysis among certain investors.

These conditions, in line with Lucas Critique (see Lucas, 1976 for more details), may weaken the impact of companies' financial data on stock prices and returns. For this reason, the study aims to examine the role and influence of financial ratios in predicting stock prices to make a relevant contribution to the literature.

3. Data and Methodology

3.1. Data

The study examines the impact of companies' financial ratios on their stock performance. Similar to other developing countries, the industrial sector plays a critical role in the Turkish economy. In this context, companies listed on Borsa Istanbul and operating in the industrial sector have been selected as the target group for the research. In this criteria, the top ten companies having the highest market capitalization as of the second quarter of 2024 (see Table 1 for details), were included in the research.

Table 1. The Information of the Top Ten Industrial Companies by Market Capitalization

Name of Company	Ticker Symbol	Market Value	Balance Sheet Date (2024, Q2)
Türk Hava Yolları	THYAO	₺398.8 B	August 8
Bim Birleşik Mağazalar	BIMAS	₺333.1 B	June 12
Ford Otosan	FROTO	₺321.8 B	August 06
Türkiye Petrol Rafinerileri	TUPRS	₺310.8 B	August 05
Enka İnşaat ve Sanayi	ENKAI	₺294 B	August 16
Aselsan	ASELS	₺255.4 B	May 28
Kent Gıda	KENT	₺217.8 B	June 11
Turkcell İletişim Hizmetleri	TCELL	₺210.9 B	May 27
Sasa Polyster Sanayi	SASA	₺196.9 B	August 26
Coca-Cola İçecek	CCOLA	₺188.6 B	August 19

Source: Authors' construction based on the Fastweb Financial Analysis Database

Throughout the study, the companies will continue to be referred to by their ticker symbols. The research covers the 10-quarter period between 2021/Q4 and 2024/Q1. The dependent variable in the research is the stock returns of the companies; while the independent variables are the companies' financial ratios, including Return on Assets (ROA), Return on Equity (ROE), Return on Invested Capital (ROIC), Debt-to-Equity (D/E), and Quick Ratio (QR). Financial ratio data was included in the study after taking their natural logarithms.

Stock return data was obtained from Refinitiv Eikon and financial ratio data was obtained from FastWeb. Eviews13 was used for the data analysis.

3.2. Methodology

The study employed the Generalized Method of Moments (GMM), one of the dynamic panel regression models (Hansen, 1982). The method is a widely used econometric technique developed by Hansen (1982) for estimating parameters in models with potential endogeneity and heteroskedasticity. GMM is particularly valuable when the traditional ordinary least squares (OLS) assumptions, such as no endogeneity and homoscedasticity, are violated. This method uses moment conditions, derived from the model, to provide consistent and efficient estimates.

The key advantage of GMM is its flexibility, as it does not require strong distributional assumptions. Instead, it relies on the availability of instrumental variables that are uncorrelated with the error term, allowing for consistent estimation in the presence of endogenous explanatory variables. GMM estimators can handle both cross-sectional and panel data, and they are especially useful in dynamic panel data models, where lagged dependent variables may introduce endogeneity.

In dynamic panel models, GMM employs lagged values of the dependent variable as instruments, which helps to correct for biases that may arise from endogeneity or serial correlation in the error terms. Moreover, GMM is often used in its two-step variant, where the first step involves estimating residuals to construct a consistent weighting matrix for a more efficient second-step estimation.

Dynamic panel regression models not only consider the contemporaneous periods of the variables but also include the past periods of the variables as regressors in the model to reveal the linkage between them. Therefore, dynamic panel regression models stand out compared to static models when it comes to examining the relationships between economic variables, many of which have a dynamic structure. The linear dynamic panel regression equation is as follows.

$$y_{it} = \alpha y_{i(t-1)} + \beta X_{it} + \mu_t + \varepsilon_{it} \quad (1)$$

In the dynamic panel regression model, the lagged value of the dependent variable is added to the model (Kripfganz and Scwarz, 2019: 528). In the Equation 1, μ_t represents the individual-specific effect (fixed effect). Consequently, a correlation problem arises between the lagged dependent variable and the fixed effect. Anderson and Hsiao (1982) proposed taking the first difference of the equation to eliminate the fixed effect.

$$\Delta y_{it} = \alpha \Delta y_{i(t-1)} + \beta \Delta X_{it} + \Delta \varepsilon_{it} \quad (2)$$

where $\Delta y_{it} = y_{it} - y_{i(t-1)}$, $\Delta X_{it} = X_{it} - X_{i(t-1)}$, $\Delta \varepsilon_{it} = \varepsilon_{it} - \varepsilon_{i(t-1)}$

However Arellano and Bond (1991) argued that the estimator does not take all potential orthogonality conditions and proposed a new estimator with additional moment restrictions. Therefore, they used lagged levels of dependent variable and regressors as instruments to deal with the endogeneity of the lagged value of the dependent variable.

$$Q(\theta) = \sum_{i=1}^{N} (z'_{it} \Delta v_{it})' W (z'_{it} \Delta v_{it}) \quad (3)$$

where Z is the matrix of instruments, v_{it} is the residual, W is the weighting matrix, θ is the vector of parameters to be estimated.

Moreover, Arellano and Bond (1991) suggested a two-step GMM estimator to make more precise estimations. With the two-step estimator, a simple estimation is first conducted, allowing for the estimation of the error terms. In the second step, these estimated error terms are used to calculate a more accurate weighting matrix, and the parameters are re-estimated accordingly.

GMM is a highly effective method for controlling endogeneity and ensuring robustness against heteroskedasticity and serial correlation (Çoşkun and Kök, 2011: 79).

This analysis applies two-step Arellano-Bond estimator (commonly referred as two-step difference GMM). The dynamic panel regression model to be estimated is as shown in Equation 4.

$$R_{it} = \alpha R_{i(t-1)} + \beta_1 lnROA_{it} + \beta_2 lnROE_{it} + \beta_3 lnROIC_{it} + \beta_4 lnQR_{it} + \beta_5 lnD/E_{it} + \mu_t + \varepsilon_{it} \quad (4)$$

One of the prerequisites of Difference GMM is that the cross-sectional dimension must be larger than the time series dimension (i.e., N ≥ T). Additionally, the cross-sectional dimension should also be larger than the number of instruments in the model (i.e., N > Z). In this research; N = 10, T = 10, Z = 6. Moreover, to test the consistency of the Difference GMM model, certain diagnostic tests need to be conducted. One of them is the test for the validity of instruments. The null hypothesis here is that all overidentifying restrictions are valid. The alternative hypothesis is that at least one of the overidentifying restrictions is invalid. To test the validity of instruments, the J statistic from the Hansen (1982) test is examined. However, the J statistic should not typically be evaluated

using the conventional p-value threshold of 0.05 (see Roodman, 2009a: 142 for detailed discussion). Roodman (2009a) suggests a "common sense" for evaluating the J statistic, proposing a minimum p-value threshold of at least 0.25. Another potential problem that needs to be tested is the serial correlation in the model. Serial correlation is tested using the Arellano-Bond (1991) test. The null hypothesis states that there is no second-order autocorrelation. For the hypothesis, the p-value of AR(2) should be examined instead of AR(1) (see Roodman, 2009b: 119,121 for detailed discussion). If the p-value of AR(2) is greater than 0.05, the null hypothesis cannot be rejected. Additionally, the Wald test should be applied to determine the significance levels of the regression coefficients in the model. The Wald test assumes the null hypothesis that the coefficients are equal to zero. If the p-value is less than 0.05, the null hypothesis is rejected.

4. Findings

The results are summarized in the Table 2 below. According to the diagnostic test results, the J statistic p-value was found to be 0.4675. In this case, the null hypothesis that the overidentifying restrictions are valid cannot be rejected. This result supports the validity of the model specification. According to the Arellano-Bond test results, the AR(2) p-value was found to be 0.9538, indicating that the null hypothesis of no serial correlation in the model cannot be rejected. Additionally, the Wald test results show that the regression coefficients in the model are statistically significant (p-value = 0.000).

Table 2. Estimation Results of Dynamic Panel Regression Model

Regressor	Coefficient	Std. Error	t-Statistic	Prob.
R(-1)	-0.038008	0.284056	-0.133805	0.8969
lnROA	-4.432467	1.569170	-2.824720	0.0223
lnROE	3.022145	1.142553	2.645080	0.0295
lnROIC	0.757002	1.133105	0.668078	0.5229
lnQR	0.119629	0.736442	0.162442	0.8750
lnD/E	-2.535357	0.860408	-2.946692	0.0185
Diagnostic Tests				
J-statistic	2.542925	Prob.(J-statistic)		0.4675
AR(2) Prob.	0.9538	Wald Chi2 (Prob.)		105.7980 (0.000)

According to the estimation results of the Dynamic Panel Regression Model, it has been determined that both lnROA and lnD/E have a negative and statistically significant (denoted by P<.05) effect on stock returns. On the other hand, it has been determined that lnROE has a positive and statistically significant (denoted by P<.05) effect on stock returns. When examining the regressor coefficients, a 1 percent increase in lnROA decreases stock returns by approximately 4.4 percentage points; a 1 percent increase in lnD/E decreases stock returns by approximately 2.5 percentage points and a 1 percent increase in lnROE increases stock returns by approximately 3 percentage points.

5. Conclusion and Recommendations

This study investigates the effects of some key financial ratios on stock returns. The aim is to provide insights into the efficiency of Türkiye's stock markets while also offering predictive information to savers for their investment decisions. The study found that ROA, ROE, and D/E ratios have an impact on stock returns. Consistent with the general consensus in the literature (Ahsan, 2012; Rialdy, 2019; Lusiana, 2020; Sitorus et al., 2021; Denendra et al., 2023; Ngadiman and Widjaja, 2023) a positive effect from ROE on stock returns was identified. The impact of D/E on stock returns, however, can theoretically vary (Wahyono et al., 2019; Tarsono, 2021; Yuninda and Kusumawardhani, 2021; Mukhtar, 2022; Noegroho et al., 2022; Sunaryo et al., 2023). One perspective is that the negative effect of borrowing costs on firm profitability may also negatively influence stock values. Another perspective is that the leverage effect of borrowing may positively impact stock values. According to the research findings, D/E has a negative effect on stock returns. While ROA is theoretically expected to have a positive impact on stock value similar to ROE, the study concluded that ROA has a negative effect on stock returns. However, there are also studies in the literature that report similar findings (Bukit, 2013; Atidhira and Yustina, 2017; Hertina and Saudi, 2019; Panggabean et al., 2021). It is believed that the underlying reason for this situation is the investors' concerns about the sustainability of corporate profitability. As the study covers a short-term period, businesses may experience extraordinary profits during this time frame. Uncertainties regarding the sustainability of earnings obtained by the company can weaken long-term stability expectations, leading to fluctuations in stock prices. Additionally, the study included companies at the top in terms of market value. The possible decline in investors' growth expectations for these companies and their shift towards value stocks could be another reason for this result. Indeed, saturated markets can significantly increase risks related to earnings and market value, particularly for companies that benefit from high leverage along with borrowing costs.

The findings of this study highlight the significant impact of financial ratios on stock returns in the industrial sector of Borsa Istanbul. However, while the results provide valuable insights, it is important to recognize the limitations of the study. The research was confined to the top ten companies in the industrial sector, and the analysis was conducted over a relatively short period of ten quarters. Future studies could expand the dataset to include more companies across different sectors and cover a longer time frame. Additionally, the inclusion of macroeconomic variables, such as inflation and interest rates, could offer a more comprehensive understanding of the factors influencing stock returns, providing investors with deeper insights for making informed decisions.

Moreover, this study focused primarily on static financial ratios as predictors of stock performance. Given the dynamic nature of financial markets, incorporating forward-looking indicators, such as earnings forecasts or industry growth trends, could enhance the predictive accuracy of the model. Further research could also explore the role of non-financial factors, such as corporate governance, innovation capacity, and environmental, social, and governance (ESG) criteria, which are increasingly becoming critical in investment decision-making processes. By broadening the scope of analysis, future studies could provide a more holistic view of the determinants of stock returns in emerging markets like Türkiye.

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