Chapter **3**

Determination of Causality Relationship Between Profitability Ratios: An Application on BIST Dividend 25 Index 🔓

Batuhan Medetoğlu[1]

Ömer Keskin[2]

Abstract

Investment refers to generating returns by utilizing the remaining amount after expenses are deducted from income. It involves allocating resources today for future consumption. Savings can be invested in a range of assets. Investors' risk perception expected return levels, personality traits, and psychological and external factors play an active role in the investment process. Various forecasting techniques are available for investments in financial assets, including fundamental analysis, technical analysis, and computer-aided analysis methods. This study analyzes the relationships between the financial ratios of companies listed in the BIST Dividend 25 Index, which enables investors to earn dividends in addition to benefiting from price movements. The primary objective is to identify the causal relationships between the Net Profit Margin and Return on Equity ratios within this index. By examining the relationship between these two important financial ratios, the study provides valuable insights to investors and other stakeholders about the complexities of the investment process. A sample of 20 companies from the BIST Dividend 25 Index was selected, and quarterly data for the two financial ratios from 2018Q1 to 2024Q1 were collected. The study applies Correlation Analysis and the Dumitrescu & Hurlin (2012) Panel Causality Test. The analysis results indicate a bidirectional causal relationship between the two financial ratios, with a weak negative correlation between the variables. This suggests that the two financial ratios within the relevant index are interrelated. The study is original in its exploration of the relationship between these two financial ratios using current data from companies included in the dividend index. It aims to guide companies in the sector, market participants, and researchers.

1   Assistant Professor, Burdur Mehmet Akif Ersoy University, bmedetoglu@mehmetakif.edu.tr,
    ORCID: 0000-0002-8400-1232

2   Lecturer, Dr., Van Yüzüncü Yıl University, omerkeskin@yyu.edu.tr,
    ORCID: 0000-0002-1939-2791

1.Introduction

Various indices calculated by Borsa Istanbul (BIST) are closely monitored by both domestic and international investors. For a company to be included in one of the indices published by BIST, it must meet all the qualifications required for that particular index. For instance, inclusion in the BIST Sustainability Index, which has been published since November 2022, requires companies to surpass a certain threshold in sustainability-related categories (BIST, 2024b). Similarly, the BIST Dividend 25 Index, launched in July 2011, comprises the stocks of 25 companies distinguished by their dividend yield and liquidity (BIST, 2024c). As such, the BIST Dividend 25 Index is particularly attractive to investors seeking to diversify their portfolios with a focus on both liquidity and dividend returns.

BIST Dividend 25 Index includes 25 companies with high dividend yields and high market value of their publicly held shares. Therefore, the stocks in this index form a more liquid portfolio compared to those in the BIST Dividend Index, which serves a similar purpose (Mazgit, 2013: 227). The sectoral distribution of companies in the BIST Dividend 25 Index is as follows: banks (30.9%), holdings and investment companies (20.3%), retail trade (17.6%), telecommunications (8.2%), metal goods, machinery, electrical appliances, and transportation vehicles (7.9%), food, beverages, and tobacco (6.3%), and other sectors (8.8%) (BIST, 2024a). Table 1 provides detailed information on the 25 companies included in this index.

Table 1. Stock Composition of the BIST Dividend 25 Index

Stock	Stock Name	Sector	Weight in Index (%)
BIMAS	Bim Birleşik Mağazalar A.Ş.	Trade	17.31
AKBNK	Akbank	Banking	11.4
KCHOL	Koç Holding	Holding and Investment	8.46
TCELL	Turkcell	Communication	7.95
ISCTR	İş Bankası	Banking	7.61
SAHOL	Sabancı Holding	Holding and Investment	7.47
YKBNK	Yapı Kredi Bankası	Banking	6.84
GARAN	Garanti Bankası	Banking	4.81
SISE	Şişecam	Holding and Investment	4.47
FROTO	Ford Otosan	Automotive	4.09
AEFES	Anadolu Efes	Food and Beverages	2.95
MAVI	Mavi Giyim Sanayi Tic. A.Ş.	Trade	1.93
TOASO	Tofaş Fabrika	Automotive	1.92
ENKAI	Enka İnşaat	Construction	1.79

EKGYO	Emlak Konut GYO	Real Estate Investment Trust	1.51
TTRAK	Türk Traktör	Automotive	1.34
DOAS	Doğuş Otomotiv	Automotive	1.22
ISMEN	İş Yatırım	Brokerage	1.16
ALARK	Alarko Holding	Holding and Investment	1.1
ARCLK	Arçelik	Metal Goods, Machinery	1
DOHOL	Doğan Holding	Holding and Investment	0.99
ENJSA	Enerjisa Enerji	Electricity	0.97
AKSA	Aksa	Chemicals, Petroleum, Plastics	0.84
VESBE	Vestel Beyaz Eşya	Metal Goods, Machinery	0.46
ECILC	Eczacıbaşı İlaç	Healthcare and Pharmaceuticals	0.44

Source: Stock Exchange and Investment (2024)

As shown in Table 1, the stock with the highest weight in the BIST Dividend 25 Index is BİM Birleşik Mağazalar A.Ş., while the stock with the lowest weight is Eczacıbaşı İlaç. Additional details and characteristics of the index are presented in Table 2.

Table 2. Features of the BIST Dividend 25 Index

Feature	Detail
Index code	XTM25
ISIN code	TRAXIST00061
Index type	Market value weighted, non-weighted, price
Index starting value (30.06.2011)	632.694
Current index value (16.09.2024)	13,368.720
Total market value (Turkish Lira)	4,136,122,640,285.87
Number of investors (31.08.2024)	2,562,458

Source: BIST (2024a)

As illustrated in Table 2, the initial value of the BIST Dividend 25 Index was calculated at 632.6, while its current value stands at 13,368.7. The positive difference between the revenue generated and the expenses incurred within a given period is referred to as profit. Generating profit is the primary objective that businesses seek to achieve through their operations. Consequently, profitability ratios are employed to analyze whether the profit margins generated by businesses are adequate. Profitability is fundamentally

linked to a firm's sales and capital, and thus, the ratios employed in profitability analyses are typically evaluated on these two factors (Karagül, 2013: 80-81). These ratios are closely monitored by current stakeholders as well as potential investors, as they serve as critical indicators for assessing a company's success and the sustainability of its operations (Erokyar, 2008: 4). Additionally, profitability ratios reflect the efficiency with which a business is managed and play a crucial role in evaluating managerial competence (Ercan & Ban, 2016: 44).

The main profitability ratios used as indicators in academic studies include Return on Equity (ROE), Net Profit Margin (NPM), Gross Profit Margin (GPM), and Return on Assets (ROE) (Acar & Mortaş, 2011; Karadeniz et al., 2016; Sarıaslan & Erol, 2008 ve Çalış & Sakarya, 2022). Equity is the difference between the business's total assets and liabilities. This concept refers to the sum of the capital put in by the partners or owners of a business and the values it produces. Therefore, the amount of equity represents the rights of those who put capital into the business on the assets of the business (Arıkboğa, 2011: 220).

ROE represents the profit generated for each unit of capital invested by the business owners or partners. It is calculated by dividing the business's annual net profit by the total equity (Sarıtaş et al., 2016: 95):

$$ROE = \frac{\text{Net Profit}}{\text{Equity}} \qquad (1)$$

NPM reflects the profitability level of a company's sales. In other words, NPM measures how much profit the company generates from every 1 TL of sales (Yenisu, 2019: 33). A higher NPM, which indicates the profit after tax, is generally viewed positively for the company. Factors influencing this margin include the country's economic conditions, the use of debt in financing, and high fixed costs (Sayılır, 2019: 114). NPM is calculated by dividing the company's net profit by net sales (Bülüç et al., 2017: 69; Çalış & Sakarya, 2023: 778):

$$NPM = \frac{\text{Net Profit}}{\text{Net Sales}}. \qquad (2)$$

GPM represents the ratio of a company's gross profit to its net sales (Kiracı, 2009: 165). This ratio offers insight into the company's gross

profitability. A high or increasing GPM is generally interpreted as a positive indicator for the company (Tenker & Akdoğan, 2010: 669):

$$GPM = \frac{\text{Gross Sales Profit}}{\text{Net Sales}} \tag{3}$$

ROA is the ratio of a company's net profit to its total assets. This metric indicates how effectively the company's assets are being utilized to generate profits. In other words, a high ROA suggests that the company's assets are being efficiently leveraged to produce profits (Güçver, 2018: 106; Çalış, 2022: 112):

$$ROA = \frac{\text{Net Profit}}{\text{Total Assets}} \tag{4}$$

This study aims to investigate the causal relationship between ROE and NPM for 20 companies listed in the BIST Dividend 25 Index. The study begins by reviewing relevant literature, followed by a presentation of the analysis and findings, and concludes with recommendations based on the results.

2. Literature Review

There are numerous studies in the Turkish literature that directly examine the BIST Dividend 25 Index. Table 3 summarizes a selection of these studies as a general overview of the relevant literature.

Table 3. Summary of Literature

Author(s)	Period Examined	Methodology Applied	Topic	Finding
Mazgit (2013)	-	Event study method	The impact of being listed in the BIST Dividend 25 Index on stock returns	Changes in the BIST Dividend 25 Index do not significantly affect the price performance of the included stocks.
Kaya (2014)	2005-2013	Panel data analysis	The relationship between firms' dividend payout ratios and stock values	There is a positive relationship between earnings per share and stock prices.

Altın (2017)	2013-2015	Kolmogorov-Smirnov and Levene tests	Determination of anomalies in the stock returns of companies	Anomalies exist in stock returns.
Zeren (2017)	2001-2017	Pedroni, Kao, Cusum, and Westerlund panel cointegration tests, DOLS/FMOLS estimators	The relationship between dividend distribution and firm value	No statistically significant relationship exists between dividend distribution and firm value.
Ünal and Ersoy (2020)	2009-2018	Panel regression analysis	The impact of dividend distribution policies on financial performance	Dividend distribution positively and significantly affects both ROE and ROA.
Şit (2021)	2010Q1-2021Q1	Durbin-H panel cointegration test and CCE coefficient estimator	The effect of dividend distribution policies on firm value	Dividend decisions influence firm value.
Sarılı and Gündoğdu (2021)	May 2011-April 2019	Johansen cointegration test	Examination of the dividend anomaly	Dividend anomaly is present.
Özkan and Yavuzaslan (2022)	June 2019-December 2020	Cross-sectional absolute deviation	Determination of herd behavior in price movements in the BIST Dividend 25 Index during COVID-19	Investors exhibited herd behavior in the BIST Dividend 25 Index before and after COVID-19.
Yılmaz and Gül (2023)	2016-2021	SD and WASPAS methods	Interaction between internal firm-specific and market-specific financial dynamics and firm performance	Firms with high dividend yield, profitability ratio, and market value, and low leverage ratio, perform better.
Çilek and Şeyranlıoğlu (2024)	2020-2022	Grey relational analysis method	The relationship between dividend yield and profitability ranking of firms	No significant relationship exists between dividend yield and profitability ranking of firms.

As seen in the literature review, the BIST Dividend 25 Index has generally been examined in terms of aspects such as the relationship between dividend distribution policies and firm values, and the presence or absence of anomalies in stock returns. This study differentiates itself from existing studies by utilizing profitability indicators such as ROE and NPM and investigating the causal relationship between these indicators. Furthermore, it employs the panel data analysis method on recent data. The study is anticipated to offer valuable insights for index investors, researchers, and all stakeholders with an interest in this area.

3.Method and Findings

This study investigates the causality relationship between Net Profit Margin (NPM) and Return on Equity (ROE) ratios of companies included in the BIST Dividend 25 Index. The index comprises the 25 stocks with the highest market value, ranked within the top two-thirds based on dividend yields (Borsa Istanbul, 2024). Furthermore, investors are attracted to the companies included in this index primarily due to their dividend distribution policies. For this reason, the companies within the index were selected as the sample, and the causal relationship between the two key financial ratios—Net Profit Margin and Return on Equity—was analyzed. To ensure a homogeneous structure in the sample selection, banks and enterprise data with discontinuous data (AKBNK, GARAN, ISCTR, ENJSA, YKBNK) were excluded. As a result, the final analysis was conducted using data from 20 enterprises. Quarterly NPM and ROE ratios were collected for these enterprises over the period from the first quarter of 2018 (2018Q1) to the first quarter of 2024 (2024Q1). The sample size was set at 20 enterprises, with 25 periods of data. The Dumitrescu & Hurlin (2012) Panel Causality Test was employed as the methodological approach to analyze the causal relationships.

The data were collected from Fintables (Fintables, 2024). Table 4 provides detailed information on the periods and codes corresponding to the relevant data.

Table 4. Financial Ratios and Period

Financial Ratio	Code	Date Range
Net Profit Margin	NPM	2018Q1-2024Q1
Return on Equity	ROE	

Source: (Fintables, 2024)

As part of the study, the descriptive statistics of the data were first presented. These statistics are outlined in Table 5, providing an overview of the key characteristics of the dataset.

Table 5. Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Min.	Max.	Correlation
NPM	500	162.1364	1134.731	-1351.01	17474.5	-0.08
ROE	500	38.85344	41.96179	-3.69	324.06	

Table 5 presents the observation values, mean values, standard deviation, minimum and maximum values, as well as the correlation coefficient of the dataset. The results indicate a weak negative correlation between the variables. Before applying the Dumitrescu & Hurlin (2012) panel causality test, several assumption tests were conducted. As part of this process, the presence of multicollinearity was assessed. To this end, Variance Inflation Factor (VIF) analysis was performed, which detects multicollinearity issues in the data. According to various sources, the VIF coefficient should remain below 5 or, in some cases, 10 (Kutner et al., 2005). The equation for this analysis is provided below.

$$VIF_i = \frac{1}{1 - R_i^2} \tag{5}$$

The VIF analysis results are given in Table 6.

Table 6. VIF Analysis Result

Variable	VIF	1/VIF
ROE	1.00	1.000000
Mean VIF	1.00	

According to the results presented in Table 6, there is no evidence of a multicollinearity problem. Following this, the analysis proceeded to examine the existence of inter-unit correlation, also known as cross-sectional dependence, using the Pesaran (2004) test. The Pesaran test utilizes the residuals from the Augmented Dickey-Fuller (ADF) regression estimate to assess inter-unit correlation. It does so by calculating the correlation of each unit with all other units, excluding itself (Pesaran, 2004). The balanced panel equation for this test is provided below (Yerdelen Tatoğlu, 2020).

$$CD = \sqrt{\frac{2T}{N(N-1)}} \left(\sum_{Y=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij} \right) \tag{6}$$

Pesaran (2004) CD test results are given in Table 7.

Table 7. Pesaran (2004) CD Test Result

Variable	CD-test	p-value	Corr.	Abs (corr.)
NPM	9.13	0.000	0.133	0.399
ROE	39.09	0.000	0.567	0.690

Upon examining the results in Table 7, it is evident that there is a correlation between the units based on the probability values. When such correlation exists between units, further assumption testing should proceed using second-generation panel unit root tests (Yerdelen Tatoğlu, 2020; Çalış vd., 2023). In line with this, the Im, Pesaran, and Shin (IPS) unit root test was employed to assess stationarity. The hypotheses for the test are formulated as follows: H_0 "All units contain unit roots" and H_1 "Some units are stationary" (Im et al., 2003). The results of this test are presented in Table 8.

Table 8. Im, Peseran, Shin (IPS) Unit Root Test Result

Variable	Statistic	p-value
NPM	-14.2819	0.0000
ROE	-2.7599	0.0029

Upon examining the results in Table 8 and reviewing the probability values, it is concluded that the H_0 hypothesis is rejected, indicating that the series is stationary. The final assumption test involves analyzing the homogeneity of the data. For this analysis, the Swamy S and Delta tests were applied. The Swamy S test indicates that the data is homogeneous if there is no significant difference between the matrices (Swamy, 1971). The hypothesis for the relevant test is as follows:

$$\hat{S} = \chi^2_{k(N-1)} = \sum_{i=1}^{N} (\hat{\beta}_i - \bar{\beta}^*)'.\hat{V}i^{-1}.(\hat{\beta}_i - \bar{\beta}^*) \tag{7}$$

To further test the homogeneity of the data, the Delta test was conducted in addition to the Swamy S test (Erataş, 2013). The Delta test is calculated with the equations below (Pesaran and Yamagata, 2008).

$$\tilde{\Delta} = \sqrt{N} \frac{N^{-1}\hat{S} - k}{\sqrt{2k}} \tag{8}$$

$$\tilde{\Delta}_{adj}= \sqrt{N}\frac{N^{-1}\tilde{S}-E(\tilde{Z}_{it})}{\sqrt{Var\,(\tilde{Z}_{it})}} \tag{9}$$

Swamy S and Delta test results are given in Table 9.

Tablo 9. Swamy S and Delta Test Result

Swamy S Test	Delta Test	
chi2 (38) = 159.31	$\tilde{\Delta}$. Test Statistic=5.806	
	p-value=0.000	
Prob > chi2=0.000	$\tilde{\Delta}_{adj}$ Test Statistic =6.189	
	p-value=0.000	

According to the results of the Swamy S and Delta tests, the data were determined to be heterogeneous. To examine the causality relationships within the study, the Dumitrescu & Hurlin (2012) panel causality test, which is suitable for heterogeneous panels, was applied. The fundamental hypothesis of this method for heterogeneous panels is that all β_i. are equal to zero (indicating no causality), while the alternative hypothesis posits that some β_i differ from zero (indicating the presence of causality). The corresponding equations are provided below (Dumitrescu & Hurlin, 2012; Yerdelen Tatoğlu, 2020). In these equations, W represents the Wald statistic, and Z refers to the standard projection matrix in the linear regression model.

$$Y_{it} = a_i + \sum_{k=1}^{K} \gamma_i^{(k)} Y_{it-k} + \sum_{k=1}^{K} \beta_i^{(k)} X_{it-k} + \varepsilon_{it}. \tag{10}$$

$$\overline{W}_{N,T} = \frac{1}{N}\sum_{\tilde{Y}=1}^{N} W_{i,T} \tag{11}$$

$$\overline{Z}_{N,T} = \sqrt{\frac{N}{2K}}\left(\overline{W}_{N,T}-K\right) = \overset{T,N\to\infty}{\to} N(0,1). \tag{12}$$

When N is large:

$$\overline{Z}_N = \sqrt{\frac{N}{2\times K}\times\frac{(T-4)}{(T+K-2)}}\times\left[\left(\frac{T-2}{T}\right)\overline{W}_{N,T}-K\right] \tag{13}$$

Normally Distributed:

$$\tilde{Z}_N^{Hnc} = \sqrt{\frac{N}{2 \times K} \times \frac{(T-2K-5)}{(T-K-3)} \times \left[\left(\frac{T-2K-3}{T-2K-1} \right) \bar{W}_{N,T} - K \right]} \xrightarrow{N \to \infty} N(0,1). \quad (14)$$

In the application of the Dumitrescu & Hurlin (2012) panel causality test, two hypotheses were formulated to analyze the causality relationships. These hypotheses are as follows:

$H_1 = The \ \textbf{NPM} \ variable \ is \ the \ cause \ of \ the \ \textbf{ROE} \ variable.$

$H_2 = The \ \textbf{ROE} \ variable \ is \ the \ cause \ of \ the \ \textbf{NPM} \ variable.$

The results of the analysis are presented in Table 10.

Table 10. Dumitrescu & Hurlin (2012) Granger Panel Causality Test Result

Hypotheses	W-bar Statistic	Z-bar Statistic	p-value	Causality
The NPM variable is the cause of the ROE variable.	49.5424	56.2129	0.0000	NPM => ROE
The ROE variable is the cause of the NPM variable.	22.1029	20.7887	0.0000	ROE => NPM

In the application of the Dumitrescu & Hurlin (2012) panel causality test, the lag length was determined using the Akaike Information Criterion (AIC). When reviewing the results in Table 10, it is evident that there is a bidirectional causality between the Net Profit Margin (NPM) and Return on Equity (ROE) variables. Both variables have the capacity to influence each other, demonstrating mutual causality at the 1% significance level. As a result, the hypotheses H_1 and H_2 are accepted, while the null hypothesis of the method is rejected, confirming the existence of mutual causality between NPM and ROE.

CONCLUSION AND DISCUSSION

Finance is the function that ensures the optimal management of resources to meet funding needs. The process includes making decisions related to financing, investment, and dividend distribution and formulating associated policies, which are core aspects of financial management. After securing funds and covering expenses, additional funds are typically sourced to address potential future financing needs, a process known as investment. This concept can be applied to physical assets such as buildings, vehicles, machinery, equipment, and land, as well as through financial assets. The

primary financial assets include stocks, bonds, bills, and other instruments such as futures contracts, warrants, real estate certificates, income-sharing certificates, repos, reverse repos, and deposits. This study examines financial markets, with companies listed on the BIST Dividend 25 Index as the sample. The selection of this index is justified by its appeal to investors due to its focus on dividend distribution. Data of the companies operating in the relevant index were obtained, and the relationships between the relevant financial ratios were determined. The variables taken within the scope of the study are Net Profit Margin and Return on Equity. Twenty of the 25 companies operating in the index were taken as a sample. Banks and companies with missing data were excluded from the sample. Data between 2018Q1 and 2024Q1 were taken to analyze from a comprehensive data range. Relevant data were obtained quarterly. The Dumitrescu & Hurlin (2012) Panel Causality Test was applied to the dataset to identify potential causal relationships between variables. Prior to conducting this test, several assumption tests were performed, including Correlation Analysis, VIF Analysis, the Pesaran (2004) test, the Im, Pesaran, Shin (IPS) Unit Root Test, the Swamy S test, and the Delta test. These tests were employed to assess factors such as correlation, stationarity, and homogeneity across units. The Correlation Analysis revealed a weak and negative relationship between the variables. However, the Panel Causality Test indicated a bidirectional causal relationship between the Net Profit Margin and Return on Equity. The results, significant at the 1% level, demonstrate the interaction between these two financial ratios. This finding offers valuable insights, particularly for investors focused on fundamental analysis, as it provides guidance on assessing companies listed in the index. Moreover, it complements technical analysis and computer-aided analytical techniques, offering a broader perspective on firms' financial performance. The study underscores the importance of financial ratios in investment decision-making. Future research is recommended to analyze the same index and financial ratios using alternative methodologies to compare and expand upon the findings of this study.

References

Acar, D., & Mortaş, M. (2011). İşletmelerin hesap verebilirlikleri ile performans oranları ilişkisi: İMKB-30 endeksinde yer alan işletmeler üzerine bir araştırma. *KMÜ Sosyal ve Ekonomik Araştırmalar Dergisi*, *13*(21), 85-94.

Altın, H. (2017). Nakit temettü ödeyen firmaların pay senetlerinde yaşanan fiyat anomalisi: BİST temettü 25 endeksi üzerine bir uygulama. *The Journal of Academic Social Sciences*, *5*(56), 24-34. https://doi.org/10.16992/asos.12830

Arıkboğa, D. (2011). *Finansal muhasebe*. İstanbul: Der Yayınları.

BIST. (2024a). *BİST temettü 25*. Access Address: https://www.borsaistanbul.com/tr/endeks-detay/420/bist-temettu-25

BIST. (2024b). *Sürdürülebilirlik endeksleri*. Access Address: https://borsaistanbul.com/tr/sayfa/165/bist-surdurulebilirlik-endeksleri

BIST. (2024c). *Temettü endeksleri*. Access Address: https://www.borsaistanbul.com/files/bist-pd-agirlikli-pay-endeksleri-ks-tr-202408-temiz.pdf

Borsa İstanbul (2024). *Dividend Indices*. Access Address: https://borsaistanbul.com/en/sayfa/2248/dividend-indices

Stock Exchange and Investment (2024). *BİST* temettü *25 endeksi hisse ağırlıkları*. Access Adress: https://www.borsaveyatirim.com/bist-temettu-25-endeksi-hisseleri-ve-endeks-agirliklari

Bülüç, F., Özkan, O., & Ağırbaş, İ. (2017). Oran analizi yöntemiyle özel hastane finansal performansının değerlendirilmesi. *International Journal of Academic Value Studies*, *3*(11), 64-72.

Çalış, N. ve Sakarya, Ş. (2022). Covid-19 Pandemisinin Mevduat Bankalarının Likidite ve Karlılık Yapısına Etkisi: BİST Bankacılık Endeksi Üzerine Bir İnceleme. Muhasebe Bilim Dünyası Dergisi, 24 (COVID-19 Özel Sayısı), ÖS194-ÖS210. https://doi.org/10.31460/mbdd.1060604

Çalış, N., Sakarya, Ş., & Yıldırım, H. H. (2023). Hissedar refahını etkileyen değişkenlerin incelenmesi: BIST Temettü Endeksi üzerine bir uygulama. Hitit Sosyal Bilimler Dergisi, 16(2), 545-562. https://doi.org/10.17218/hititsbd.1333924

Çalış, N., & Sakarya, Ş. (2023). BİST Bilişim Sektörü Firmalarının Finansal Sağlamlığının Finansal CEMATT Yöntemi ile İncelenmesi. Yönetim ve Ekonomi Dergisi, 30(4), 773-786. https://doi.org/10.18657/yonveek.1233488

Çalış, N. (2022). İslami Bankacılık Perspektifinden Ülkelerinin Finansal Performans Sıralaması Üzerine Ampirik Bir Araştırma. İçinde Yakup Aslan & Özgür Özkan (Ed.), Muhasebe, Finans ve Denetim Alanlarında Yenilikçi Yaklaşımlar (s. 107-128). Efe Yayınları.

Çilek, A., & Şeyranlıoğlu, O. (2024). Temettü verimi ile karlılık oranları arasındaki ilişki: Borsa İstanbul temettü 25 endeksinde bir inceleme. *Cumhu-*

riyet Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 25*(1), 166-182. https://doi.org/10.37880/cumuiibf.1381845

Dumitrescu, E.-I. ve Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic modelling*, *29*(4), 1450-1460.

Erataş, F., Başçı Nur, H. ve Özçalık, M. (2013). Feldstein-Horioka bilmecesinin gelişmiş ülke ekonomileri açısından değerlendirilmesi: Panel veri analizi. *Çankırı Karatekin Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, *3*(2), 18-33.

Ercan, M. K., & Ban, Ü. (2016). *Değere dayalı işletme finansı finansal yönetim*. Ankara: Gazi Kitabevi.

Erokyar, E. (2008). *İşletmelerde karlılık ve karlılığı etkileyen faktörler*. Unpublished Master's Thesis. İstanbul: İstanbul University, Deparament of Social Sciences.

Fintable (2024). *Companies*. Access Address: https://fintables.com/

Güçver, C. (2018). *Borsa İstanbul imalat sanayi sektörüne kayıtlı firmaların finansal risk yönetimlerinde türev ürün kullanımı ve belirleyicileri*. Unpublished Doctoral Thesis. İstanbul: İstanbul Ticaret University, Finance Institute.

Im, K. S., Pesaran, M. H. ve Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, *115*(1), 53-74.

Karadeniz, E., Koşan, L., & Uzpak, B. D. (2016). Türkiye'de en yüksek satış gelirine sahip 20 şirketin satış geliri ve karlılık performansının karşılaştırmalı analizi. *Muhasebe ve Denetim Bakış*, *48*, 45-58.

Karagül, A. A. (2013). *Oran analizi*. In S. Önce (Ed.), *Mali analiz* (pp. 68–95). Anadolu University.

Kaya, A. (2014). *Kar payı dağıtım kararlarının hisse senedi fiyatı üzerine etkisi: Borsa İstanbul'da bir uygulama*. Unpublished Master's Thesis. İzmir: Dokuz Eylül University, Deparament of Social Sciences.

Kiracı, M. (2009). Stok yönetimi ve karlılık ilişkisinin finansal oranlar aracılığıyla incelenmesi: İMKB imalat sektöründe bir araştırma. *ODTÜ Gelişme Dergisi*, *36*, 161-195.

Kutner, M. H., Nachtsheim, C. J., Neter, J. ve Li, W. (2005). *Applied linear statistical models*. McGraw-hill.

Mazgit, İ. (2013). Endeks kapsamında olmanın hisse senedi getirilerine etkisi: BİST temettü 25 endeksi üzerine bir uygulama. *Sosyoekonomi*, *20*(20), 225-264.

Özkan, N., & Yavuzaslan, K. (2022). COVID-19 salgınının Borsa İstanbul pay endekslerine etkisi: Sürü davranışı üzerine bir araştırma. *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, *73*, 146-170. https://doi.org/10.51290/dpusbe.1093796

Pesaran, M. H. (2004). *General diagnostic tests for cross section dependence in panels*. Available at SSRN 572504.

Pesaran, H.M., ve Yamagata, T. (2008). Testing slope homogeneity in large panels, *Journal of Econometrics*, (142), 50-93.

Public Disclosure Platform (2024). *BIST Companies/BIST Dividend 25*. Access Address: https://www.kap.org.tr/en/Endeksler

Sarıaslan, H., & Erol, C. (2008). *Finansal yönetim: kavramlar, kurumlar ve ilkeler*. Ankara: Siyasal Kitabevi.

Sarılı, S., & Gündoğdu, A. (2021). Borsa İstanbul'da temettü anomalisinin test edilmesi. *Anadolu Akademi Sosyal Bilimler Dergisi*, *3*(3), 504-523.

Sarıtaş, H., Uyar, S. G. K., & Gökçe, A. (2016). Banka karlılığı ile finansal oranlar ve makroekonomik değişkenler arasındaki ilişkilerin sistem dinamik panel veri modeli ile analizi: Türkiye araştırması. *Eskişehir Osmangazi Üniversitesi İİBF Dergisi*, *11*(1), 87-108.

Sayılır, Ö. (2019). *Karlılık analizi*. In S. Önce (Ed.), *Mali analiz* (pp. 110–127). Anadolu University.

amy, P. (1971). *Statistical inference in random coefficient regression models*. New York: Springer

Şit, A. (2021). Kar dağıtım politikaları firma değeri üzerinde etkili midir? BİST temettü 25 endeksi üzerine bir uygulama. *Van Yüzüncü Yıl Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, *6*(12), 159-171.

nker, N., & Akdoğan, N. (2010). *Finansal tablolar ve mali analiz teknikleri*. Ankara: Gazi Kitabevi.

. M., & Ersoy, H. (2020). The effect of dividend distribution policies on financial performance: An application on BİST dividend 25 index. *Eurasian Academy ofciences Social Sciences Journal*, *29*, 60-79. https://doi.org/10.17740/eas.soc.2020.V29-05

nisu, E. (2019). Finansal tabloların oran analizi ile incelenmesi: Adese örneği. *Aksaray Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *3*(1), 19-45.

Yerdelen Tatoğlu, F. (2020). *Panel Zaman Serileri Analizi Stata Uygulamalı*. İstanbul: Beta Yayıncılık, 3. Baskı.

Yılmaz, T., & Gül, M. (2023). BİST temettü 25 endeksinde yer alan firmaların finansal performanslarının sd ve waspas yöntemiyle analiz edilmesi. *Dicle Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, *32*, 198-221.

Zeren, F. (2017). Kar payı bilmecesinin araştırılması: BİST temettü 25 endeksi üzerine bir uygulama. *Kırklareli Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, *6*(5), 172-183.