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Does Profitability Cause the Changes in Stock Prices? Evidence from the Turkish Banking Stocks

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Abstract: Stock prices reflect the future for investors. Profit and profitability ratios are considered as the data of the enterprises' past. Accordingly, whether investors make investments decisions regarding profit and profitability factors and they cause the changes in stock prices are crucial issues to be examined. The aim of the study is to investigate the causality between several profitability factors and the change in the prices of banking stocks by performing the Emirmahmutoğlu & Köse (2011) bootstrap causality test on the quarterly data obtained from six commercial banks in Turkey over the period 2010: Q1 – 2020: Q4. The findings of the study reveal that especially the earnings per share figures account for the changes in the stock price of the banks. Nonetheless, such a causal relationship can be detected for neither return on assets nor return on equity.

Keywords: Banking stocks; Stock returns; Return on assets; Return on equity; Earnings per share

1. Introduction

Stocks are the riskiest investment instruments. This situation makes it necessary for investors to concentrate on investment decisions that would maximize their returns according to the risk levels they can accept while determining the stocks they would invest. This requirement has led investors to accurately and significantly identify stock returns and the firm-specific factors affecting these returns. Assessment of company-specific factors such as companies' liquidity, financial structure, effective use of assets, profitability, and stock market performance give investors information about the real value of the stocks of the relevant companies. The view that stock prices can be predicted to a great extent by using financial ratios that reflect the real financial conditions of firms tends to lead investors and academics to identify the relationships between financial ratios and stock returns (Tesfatsion, 2004).

The reason for the existence of various studies examining the factors affecting stock prices in the financial literature is to increase the predictability of prices. Investors should be able to accurately and significantly determine the factors affecting stock prices and returns in making the right decisions. In this context, both macroeconomic factors such as exchange rates, interest rates, inflation, investment, capital and microeconomic factors such as the financial ratios of companies have been the subject of research studies. The banking sector has an important share of stocks (33%) in Istanbul Stock Exchange (BIST). The positive or negative movements in the banking sector are powerful enough to account for the fluctuation of the BIST Banks Index. Therefore, having information regarding the banking sector can be beneficial for the investor. Moreover, investors should be aware of the extent to which factors are used as selection criteria in determining the names of the banks to be included in the analysis.

The development of the economy and financial system depends solely on the coordination of certain economic actors. One of the most important of these actors is banks (Işık et al., 2017).

Profit and profitability are considered as a reflection of the past business experience for all enterprises. Investors take action by predicting the future upon making their investment decisions. Accordingly, it is anticipated that investors would not make investment decisions based on the assumed profit figures formed in the past periods.

However, this may not be the case in practice. Because all statistical forecasting methods make predictions based on the past while predicting the future. Apart from profit and profitability, the subject also has similar dynamics between business performance and performance-based ratios as well as stock returns. Therefore, one might ask whether it is possible that the stocks of the enterprises that had a successful financial performance in the past would be positively affected by this, or investors invest, in the purest sense, for the future. This argument raises a dilemma within itself. This research study can be helpful in comprehending the complex structure that led to the emergence of such a dilemma. Accordingly, this study aims to investigate whether or not banking profits cause banking stock prices to change. As shown in Table 1, different analysis techniques were used in studies on this subject.

Table 1. Literature review

Author(s)	Country and Period	Sample	Methodology	Results
Ou & Penman (1989)	USA, 1973–1984	Earnings per share, Cash dividends, receivables, inventories, plant assets, price to earnings ratio	Random Walk Model	The study, which employed a mechanical statistical prediction model to predict 1-year-ahead earnings changes, concluded that stock prices reflect naive expectations about earnings.
Fairfield et al. (2003)	USA, 1964–1993	ROA, growth in long-term net operating assets, accruals, growth in net operating assets cash flows.	Regression Analysis	It was concluded that accruals and growth in net operating assets had inverse relationships with 1-year-ahead ROA.
Titman et al. (2004)	USA, 1969–1996	Stock returns, stock prices, number of outstanding shares	Factor-Pricing Model	The study asserted a negative relation between corporate capital investments and future stock returns. Investing firms mostly earned below average stock returns over the 5 subsequent years.
Yücel (2005)	Turkey, 1992–2000	Stock returns and profits of 907 companies	Panel Data Analysis	It was concluded that the relationship between stock returns and profits was weaker in the case of negative profits.
Kalaycı & Karataş (2005)	Turkey, 1996–1997	Stock returns and financial ratios of the companies operating in food and beverages, chemical, petroleum, plastics; and sectors.	Multiple regression and factor analysis	The results concluded that stock returns were explained by profitability, stock market performance, as well as productivity ratios.
Büyükşalvarcı (2011)	Turkey, 2001–2008	Stock returns and financial ratios of Manufacturing sector companies traded in BIST	OLS, Durbin-Watson Test	The analysis findings detected a significant relationship between stock returns and financial ratios.
Sakarya & Aytekin (2013)	Turkey, 2007–2017	Stock returns and financial ratios of 16 banks	PROMETHEE (Preference Ranking Organization Method for Enrichment Evaluations)	It was concluded that there was no statistically significant relationship between the values of financial performance and stock returns.
Karcıoğlu & Özer (2014)	Turkey, 2002:Q1–2011:Q3	Stock returns and financial ratios of 113 manufacturing sector firms	Static and Dynamic Panel Data Analysis	The analysis results did not detect any significant relationship between Return on Assets and stock returns.
Ünal & Yüksel (2017)	Turkey, 2015:Q1–2017:Q2	The financial performance ratios and stock returns of seven banks	PROMETHEE Method	According to the results, there was no statistically significant relationship between financial performance and stock returns.
Kurt & Köse (2017)	Turkey, 2002:Q4–2016:Q2	Stock prices and financial ratios of nine commercial banks	Panel Granger Causality Test	The findings indicated that financial ratios affect banks' stock returns.
Senol et al. (2018)	Turkey, 2010:Q1 – 2017:Q1	Stock prices and financial ratios of 23 firms in the Metal Goods, Machinery and Equipment Maintenance sector	Dynamic Panel Data Analysis	It was determined that return on assets, liquidity ratio, and leverage ratio positively affect stock prices.
Wijaya & Yustina (2019)	Indonesia, 2010 – 2014	Stock prices, dividend payout ratio, return on assets ratio and return on equity ratio of banking companies listed in ISX	Multiple Regression Analysis	It was detected that the dividend payout ratio and return on asset ratio had significant correlations with the stock prices, whereas the return on equity ratio had an insignificant correlation.
Çalış & Sakarya (2020)	Turkey, 2015–2017	Stock returns and financial ratios of 12 banks	PROMETHEE method	According to the analysis results, there was no significant relationship between stock returns and financial ratios.

Accordingly, it is tried to determine whether there is a casual relationship between profitability indicators and average of closing stock prices of BIST Banking Index over the period 2010: Q1–2020: Q4. This research study, which examines the stocks in the BIST banking index, consists of five parts. In the first part, basic information regarding the subject is introduced. In the second part, a literature review is presented. The third part explains the data and methodology of the study. In the fourth part, the analysis of empirical findings is summarized. The fifth part covers an overall evaluation.

2. Literature Review

The knowledge of how and by which factors the stock returns are affected is quite crucial for investors when creating their portfolios. Therefore, studies examining the factors affecting stock returns occupy a large portion of the financial literature. Upon analyzing the conducted research studies, it is seen that macroeconomic variables that affect stock returns such as real interest rate, inflation, investment, exchange rate is considered, and as microeconomic factors financial ratios are taken into account.

3. Data and Methodology

In this study, the data of deposit banks in the BIST banking index are utilized to investigate whether or not the banking profits display a signal for the investor, increasing the investor's demand for stocks, and thus causing an increase or decrease in the prices of the banking stocks. The causality approach proposed by Granger (1969) is based on the dynamics that an effect cannot precede its cause. Emirmahmutoğlu & Köse (2011) stated that the future cannot be the cause of the past, so if the variable X is Granger cause of the variable Y, the changes in X are antecedent to the changes in Y. This study examines whether or not banking profits are the cause of the changes in stock prices. Banks covered in the study include the fiscal and financial data of Akbank, Garanti BBVA, Halkbank, QNB Finansbank, Vakıfbank and Yapı Kredi Bank.

Since the deposit banks sample is used in the study, Albaraka Turk Participation Bank and the Industrial Development Bank of Turkey included in the BIST banking index are excluded. Besides, due to the presence of different stocks of İşbank such as A, B, and C; it is possible to analyze the casual relationship between banking profits and stock prices based on type of the stocks. Since this situation would not provide an integrated perspective for the rest of the sample, the relevant banks could not be included in the sample. Because ICBS Turkey Bank and Şekerbank's annual balance sheet of 2020 were not published at the time of the study, they are excluded from the sample. Within all these limitations, the sample period is from 2010:Q1 to 2020:Q4. The financial data of the banks included in the sample are obtained from the Banks Association of Turkey (BAT), whereas the data relating to the closing prices of the stocks are obtained from a licensed distributor institution. As a basis for the analysis, the average closing prices for each quarter are calculated using the closing figures of the banking stocks in the sample. Moreover, the following calculations are made in accordance with the financial literature using such items as Total Assets, Total Equities, Outstanding Shares and, Net Earnings included in the financial statements of the relevant banks:

$$Return\ on\ Assets = \frac{\text{Net Earnings}}{\text{Total Assets}} \tag{1}$$

$$Return\ on\ Equity = \frac{\text{Net Earnings}}{\text{Total Equities}} \tag{2}$$

$$Earnings\ per\ Share = \frac{\text{Net Earnings}}{\text{Outstanding Shares}} \tag{3}$$

Return on assets and return on equity are the two basic profitability criteria used in the financial literature. Earnings per share is a measure of profit evaluated in terms of investors and expressed as the "bird in the hand" in financial literature. Since the nominal value of the banking stocks included in the sample is 1 TL, the outstanding shares are considered equal to the number of stocks of the banks. In this context, earnings per share can be calculated by dividing the net earnings by the outstanding shares. In order to provide basic information about the financial structure of the research sample, the values of average closing, return on assets, return on equity, and earnings per share calculated for the banks included in the sample are presented in Table 2.

Upon examining the table, it is seen that Halkbank has the highest closing price whereas Yapı Kredi Bank has the lowest closing price in terms of quarterly average closing prices. Besides, it can be claimed that the highest average of return on assets belongs to Garanti BBVA, whereas the lowest average belongs to Vakıfbank. In terms of return on equity, it can be considered that Halkbank has higher profitability compared to other banks, while the lowest figure belongs to Vakıfbank. Upon evaluating the issue in terms of earnings per share, it can be stated that

Halkbank differs from other banks in the sample with a profit per share amount of 1.22 TL. The lowest profit per share in the table (0.35 TL) belongs to Yapı Kredi Bank.

Table 2. Average values belonging to the banks included in the sample

	Average Closing	Return on Assets	Return on Equity	Earnings per Share
Akbank	6.1772	0.0112	0.0860	0.6140
Garanti BBVA	7.5606	0.0120	0.0955	0.7032
Halkbank	10.2651	0.0096	0.0999	1.2228
QNB Finansbank	9.1786	0.0091	0.0850	0.2910
Vakıfbank	4.4142	0.0077	0.0819	0.5875
Yapı Kredi Bank	2.5249	0.0093	0.0824	0.3529

In this study, by considering ROA, ROE and Earnings per Share as performance indicators, the following hypotheses can be established in order to determine whether any causal effect exists between bank performance and bank stock prices:

H_0: There is no causal relationship between bank performance and bank stock returns.

H_1: There is a causal relationship between bank performance and bank stock returns.

Firstly, the unit root test should be carried out to detect whether or not the return on assets, return on equity, and earnings per share estimated in this study cause the average closing prices is the unit root test. In this regard, the unit root test, which is widely used in practice and developed by Im et al. (2003), can investigate the existence of unit root separately for each bank in the series. Heterogeneous panel data analysis is developed by combining individual unit root tests in the Im et al. (2003) test, which would be expressed as the IPS test. In the IPS unit root test, individual unit root tests are combined to obtain results.

Following the unit root test, the causality analysis is performed. Emirmahmutoğlu & Köse (2011) causality test, using the meta-analysis developed in the study of Fisher (1992) which was a panel adaptation of the Toda & Yamamoto (1995), is a test that can be performed when the variables are not stationary at the same level. In this method, it is assumed that the heterogeneity among units is valid regardless of whether the variables are stationary or cointegrated. Critical values derived from bootstrap distributions are utilized in the method. Furthermore, the relevant test may yield separate results for both individual units and the overall panel. Emirmahmutoğlu & Köse (2011) bootstrap causality test can be performed without the need for a preliminary unit root test. Nevertheless, in the application of the Emirmahmutoğlu & Köse (2011) causality test, it is practically more appropriate to perform a unit root test, since the calculations are repeated by taking the vector numbers containing unit-roots into account.

4. Findings

Descriptive statistics of the estimated values of the banks in the sample can be seen in Table 3. Upon examining the descriptive statistics, it is seen that the average closing has the highest standard deviation value. This situation can be noticed from the high level of the maximum value in the relevant series. It is among the information that can be obtained from Table 3 that the descriptive values of return on assets and return on equity are similar.

Table 3. Descriptive statistics

	Average Closing	Return on Assets	Return on Equity	Earnings per Share
Mean	6.6867	0.0098	0.0884	0.6285
Median	5.5957	0.0091	0.0843	0.4671
Maximum	70.6658	0.0275	0.2700	2.9803
Minimum	1.6627	0.0004	0.0031	0.0124
Standard Dev.	7.1609	0.0054	0.0452	0.4868
Number of Observations		264		

Table 4. Im, pesaran and shin panel unit root test results

	Level		Difference	
	c	*c* + *t*	*c*	*c* + *t*
Average Closing	-0.7452 (0.2281)*	-1.7920 (0.0366)	-10.7640 (0.0000)	-11.3563 (0.0000)
Return on Assets	-3.1057 (0.0009)	-4.0422 (0.0000)	-	-
Return on Equity	-3.3025 (0.0005)	-3.0837 (0.0010)	-	-
Earnings per Share	-0.6554 (0.2561)	-1.8641 (0.0332)	-3.2065 (0.0005)	-1.7149 (0.0312)

*Values in parentheses indicate probability values.

It is an appropriate process in practical methodology to investigate whether or not a unit root exists in series before performing a causality analysis. Accordingly, in compliance with the causality methodology of the study, the unit root test proposed by Im et al. (2003), which provides an advantage in examining the existence of unit root individually for each series, is performed. In Table 4, the results of the IPS unit root test performed on average closing, return on assets, return on equity, and earnings per share series can be observed.

Upon examining Table 4, it is determined that the average closing and earnings per share series are stationary at 95% confidence level, I(1); whereas the return on assets and return on equity series are stationary at level, I(0). Even if the analyzed series are not stationary at the same level, an Emirmahmutoğlu & Köse (2011) causality analysis can be performed. By courtesy of the Emirmahmutoğlu & Köse (2011) study, it has become possible to apply the Toda & Yamamoto approach to the Granger causality for the panel datasets. Accordingly, causality analysis can be performed regardless of whether the variables are stationary or integrated. The motivation underlying this study is determining whether or not banking profits cause investors' demand for stocks, thus changing the stock prices. In compliance with the aim of the study, it is tried to examine whether or not the calculated return on assets, return on equity, and earnings per share cause the changes in the stock prices. The results of Emirmahmutoğlu & Köse (2011) bootstrap causality analysis performed unilaterally are presented in Table 5.

Table 5. Emirmahmutoğlu & Köse bootstrap causality test results

	Return on Assets ≠> Average Closing Price		**Return on Equity ≠> Average Closing Price**		**Earnings per Share ≠>Average Closing Price**	
	Lag	Wald	Lag	Wald	Lag	Wald
Akbank	4	4.070 (0.397)	4	11.942 (0.018)**	3	10.130 (0.017)**
Garanti	4	3.145 (0.534)	4	6.513 (0.164)	2	14.608 (0.001)*
Halkbank	4	9.731 (0.045)	4	3.940 (0.414)	1	0.525 (0.469)
QNBfinansbank	4	1.050 (0.902)	4	4.371 (0.358)	1	20.164 (0.000)*
Vakıfbank	4	3.830 (0.430)	4	6.124 (0.190)	1	10.438 (0.001)*
Yapı Kredi	4	2.324 (0.676)	4	3.872 (0.424)	3	4.650 (0.199)
Fisher test statistic		11.975 (0.448)		20.529 (0.058)***		64.544 (0.000)*

Values in parentheses indicate probability values.*, **, and *** indicate significance at 1%, 5%, and 10% significance levels, respectively.

The direction of causality, the Wald statistics, lag length coefficients selected according to Akaike criteria, and Fisher test statistics where causality can be examined in the panel as a whole are presented in Table 5. The results shown in Table 5 separately report the findings of whether the return on assets, return on equity, and earnings per share cause the change in average closing prices of stocks. The causal effect of return on assets on stocks' closing prices is determined only for Halkbank at the 5% significance level. Therefore, results suggest that Halkbank investors change their demand for stocks depending on return on assets. Similarly, upon examining the causal relationship between the return on equity and the average closing price, a causality at the 5% significance level is detected only for Akbank. Upon evaluating the results regarding the return on assets and return on equity as a whole, the Fisher test statistic reveals that no causal relationship exists at the 5% significance level. The results become more significant once the subject is analyzed in terms of earnings per share. Earnings per share is a prioritized concept for investors. Dividend earnings are based on distributable earnings per share. The return on equity and return on assets offer profitability criteria for the enterprise, whereas earnings per share can be considered the most crucial information for the investor. Accordingly, the Wald test results reveal that earnings per share of Akbank, Garanti BBVA, QNB Finansbank, and Vakıfbank stocks influence the average closing prices. Besides, upon evaluating the earnings per share results as a whole, the Fisher test statistic reveals the existence of causality at the 1% significance level. Accordingly, upon simultaneously evaluating the obtained results, it can be claimed that return on assets and return on equity do not affect closing prices of stocks, however, the earnings per share influence average closing prices.

Findings obtained from the study reveal a causal relationship sequence in the direction illustrated in Figure 1. Accordingly, Figure 1 analytically depicts the finding asserting that the amount of earnings per share for the banking sector causes the changes in the stock prices through investor preferences, whereas the return on assets and return on equity do not have a causal effect.

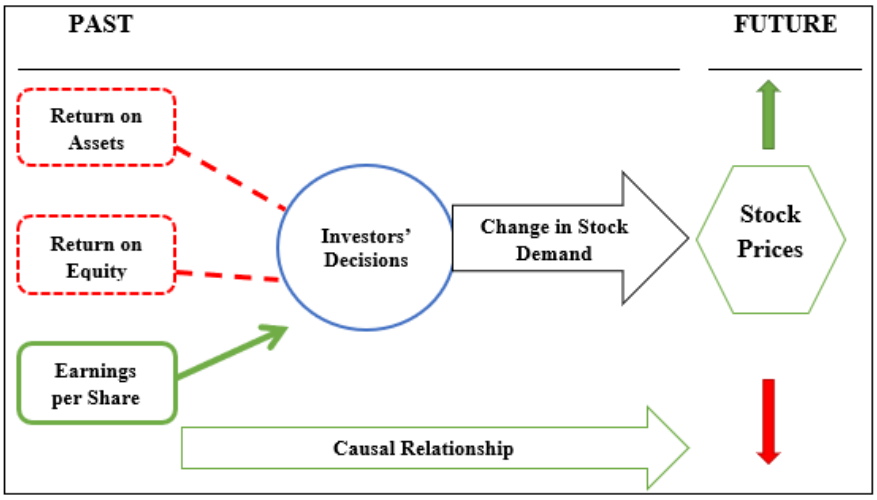

Figure 1. Direction of the causality

5. Conclusion

This study examines whether banking profit indicators lead to a change in stock prices or not. Accordingly, Emirmahmutoğlu & Köse (2011) bootstrap causality test is applied to determine whether the return on assets, return on equity, and earnings per share of six Turkish banks included in the BIST banks index cause any change in the average closing prices of their stocks. Covering the period between 2010: Q1 to 2020: Q2, the results reveal that especially the earnings per share variable affects the stock price of banks. Accordingly, the alternative hypothesis (H_1) implying a causal relationship between bank performance and bank stock returns would be accepted in terms of earnings per share and for all the banks included in the sample except for Halkbank and Yapı Kredi Bank.

This finding complies with the findings of Büyükşalvarcı (2011) and Kurt & Köse (2017). However, no such causal relationship for neither return on assets nor return on equity is detected, and both Karcıoğlu & Özer (2014) and Çalış & Sakarya (2020) revealed similar findings.

In the study of Senol et al. (2018), return on assets was found to have a significant impact on stock prices, however, the relevant study was conducted on companies in Metal Goods, Machinery and Equipment Maintenance sector, not on banks. This indicates that the causal relationship envisaged in this study may differ from sector to sector.

There may be various factors that determine the demand motivations of securities investors. The profits of the invested enterprise are also considered among such motivations. Nonetheless, the results obtained from the study reveal that investors should consider the causal relationship, especially in terms of earnings per share. In this case, issues such as the size and equity level are not considered by investors. The existence of a regulatory institution such as the Banking Regulation and Supervision Agency (BRSA) and the activities of banks being carrying out without exceeding certain risk levels can be considered as the reasons why no causal relationship can be detected between factors such as return on assets or return on equity and the average closing prices of the stocks.

Earnings per share, on the other hand, are considered as a quite determinant factor for investors. The causal relationship detected between earnings per share and average closing prices of stocks can be evaluated in this aspect.

Upon evaluating the findings obtained from the study in terms of investors, it can be claimed that it is the right strategy to invest according to the earnings per share expectation rather than the return on assets or return on equity in the periods during which the financial statements of the banks are announced. This situation reveals that the investment strategy is appropriate regardless of the size of the bank. Undoubtfully, besides the contribution of the study, there are some shortcomings of the study. Especially the number of banks included in the sample is limited. Also, the subject of the study yields merely generalized results for Turkey in terms of the related literature. Accordingly, it would be quite useful to analyze the subject with a sample consisting of different sectors in order to understand causal relationships comprehensively. The relevant investigation would constitute the subject of future studies.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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