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The Effect of The Financial Soundness Index on The Financial Performance of Banks: An Application in Turkey

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Finansal Sağlamlık Endeksinin Bankaların Finansal Performansına Etkisi: Türkiye'de Bir Uygulama

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Abstract

In this study, the effect of bank soundness on financial performance in the banking sector in Turkey is investigated. The study conducted on 11 banks operating in the BIST Bank Index. Industrial Development Bank was not included in the study as it left the commercial banks due to its activities. Annual data for the 2005-2019 period were used in the study. In the application model of the study, profitability ratios and market value ratios were determined as dependent variables and banking soundness index as independent variables. Kónya causality test was used as a method. The results show that there is a two-way relationship between Banking Strength Index and Market Value, and a one-way causality relationship from Profitability ratios to Banking Strength Index.

Keywords: Banks, soundness index, profitability ratios, market value, Kónya causality test.

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Öz

Bu çalışmada, Türkiye'de bankacılık sektöründe bankanın sağlamlığının finansal performansa etkisi araştırılmıştır. Çalışma, BIST Banka Endeksi'nde faaliyet gösteren 11 banka üzerinde uygulanmıştır. Sınai Kalkınma Bankası, faaliyetleri nedeniyle ticari bankalardan ayrıldığı için çalışmaya dahil edilmemiştir. Çalışmada 2005-2019 dönemine ait yıllık veriler kullanılmıştır. Çalışmanın uygulama modelinde bağımlı değişken olarak karlılık oranları ve piyasa değeri oranları, bağımsız değişkenler olarak bankacılık sağlamlığı endeksi belirlenmiştir. Yöntem olarak Kónya nedensellik testi kullanılmıştır. Sonuçlar, Bankacılık Güç Endeksi ile Piyasa Değeri arasında iki yönlü bir ilişki olduğunu ve Karlılık oranlarından Bankacılık Güç Endeksi'ne doğru tek yönlü bir nedensellik ilişkisi olduğunu göstermektedir.

***Anahtar Kelimeler**: Bankalar, sağlamlık endeksi, karlılık oranları, piyasa değeri, Kónya nedensellik testi.*

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1. Introduction

Banks are financial institutions that accept deposits and use these deposits as loans. It can be said that the banking sector plays a vital role for economies. Because banks and other financial institutions are important institutions that ensure the functioning of financial markets. Total assets of banks in Turkey are 3.661.505 million Turkish Lira by the October of 2020. This amount will reinforce the importance for Turkey of banks (BRSA, 2020). Without these institutions, financial markets would not be able to transfer funds from those who save to those who have productive investment opportunities (Mishkin, 2006: 7-8). Additionally, it can be stated that banks contribute to the economic growth and development of countries by making financial markets work more effectively.

The banking sector is affected by many factors such as international capital movements, the economic situation of the country or the whole world, technological developments, developments in the trade sector, and future expectations of economic units (Coşkun, 2010: 99). The presence of many factors affecting the banking sector may cause financial fragility in the sector. This situation reveals the importance of ensuring stability in the banking sector and the formation of a sound banking system.

According to the definition of Central Bank of the Republic of Turkey (CBRT) financial stability is the financial system and that could destabilize the institutions operating in this market that will create vulnerabilities are expressed as the economy's strength in the face of unexpected circumstances. In general, financial stability ensures the healthy and stable operation of the financial system, the efficient transfer of resources to production, the optimum management of the risks that may arise, and the increase of the effectiveness of the monetary policies to be implemented. In cases where financial stability cannot be achieved, some problems arise in the development, growth and development of the country's economy and increasing the welfare of the society. Considering the global economic developments, it has been revealed that financial stability is a prerequisite to ensure macroeconomic stability. For such reasons, all central banks around the world closely monitor the risks in the financial system and the stability of the financial system. It has highlighted the importance of financial fragility along with the growth to be realized in the financial system. Financial fragility can be expressed as an extremely sensitive situation where small shocks that may occur in the markets can pull the country's economy into macro-scale financial crises. Therefore, the importance of banks in the country's economy to this extent also involves the risk of financial fragility as well as major crisis risks for the national economies (Allen and Gale, 2004: 1015; TCMB, 2020).

The financial system in Turkey’s economy is mainly composed of banks. According to the Banks Association of Turkey's 2019-2020 annual report, financial institutions and banks have a share of 81% in the total financial system assets are evaluated according to their sizes. Therefore, when the concepts of financial stability/soundness are mentioned, the concepts of banking soundness and stability come to mind.

Various national and international financial institutions measure the fragility, strength, stability or soundness of the financial system. One of the measurement methods is "Banking Soundness Index". This research was performed to examine the fragility of the banking sector in Turkey and to measure the effect of soundness of banking on the financial performance of banks. The Turkish banking sector has made significant progress, especially with the BRSA established in 1999. In addition, Turkey is chosen as a sample because Turkey's banking sector is significantly advanced among developing countries. Profitability ratios and market value ratios were used as dependent variables, banking soundness index was used as independent variable and also the data for the period of 2005-2019 were used in the study. In the study, the variables of Capital Adequacy and Asset Quality, Credit Risk, Non-Operating Income, Interest and Exchange Risk and Banking Strength Index were created. The effect of this index on Profitability Ratios (consisting of Return on Assets, Equity Profitability and Net Profit for the Period) and Market Value (consisting of Market Value/Book Value, Price/Earnings and Profit Per Share) has been examined.

2. Literature Review

The importance of banks in the economic development of countries is indisputable. The banking sector is the driving force of the financial markets as well as the real markets for countries. For this reason, it is understood from the literature review that there are many studies on the banking sector, which is of great importance for countries.

The banking sector's contribution to the country's economies undoubtedly depends on the financial stability of the countries. Because in countries where there is no financial stability, the efficiency of banks cannot be mentioned. For this purpose, some studies have been conducted on the financial stability of countries and financial performance of banks (Cuestas, et.al., 2019; Kočišová, 2015; Sere-Ejembi et al. 2014; Taşkın, 2011; Tiryaki and Yılmaz, 2012). Financial stability in the studies was determined by the "financial stability index" created by the Banking Supervision and Regulation Board (BRSA) for the banking sector (Taşkın, 2011; Tiryaki and Yılmaz, 2012), by the Lerner index (Cuestas, et.al, 2019), and by the banking stability index (Kočišová, 2015; Sere-Ejembi et al. 2014. In the studies examined, it was concluded that there is a relationship between financial stability and financial performance for banks, that is, banks with financial stability have better financial performance.

The increase in the number of banks in the financial markets of countries around the world increases the competition in the banking sector. In studies conducted for this purpose, competition in the banking sector was also investigated (Andrieş and Căpraru, 2012; Eyüboğlu and Eyüboğlu, 2018; Naym, 2018; Rahim, 2017; Moyo, 2018; Schaeck and Cihák, 2010). Competition in the banking sector is determined using the Lerner index (Eyüboğlu and Eyüboğlu, 2018; Moyo, 2018; Rahim, 2017; Andrieş and Căpraru, 2012), the Panzar and Rosse model (Naym, 2018), and the Boone indicator which is an innovative model (Schaeck and Cihák, 2010). As a result of the studies, it was determined that competition has an effect on the financial activities of banks, especially on their financial performance. Accordingly, increasing competition in the banking sector affects the financial performance of banks.

With the establishment of the Banking Supervision and Regulation Board (BRSA) in 1999 and the entry into force of the Basel-II Criteria in 2004, banks started to take risk management under control and operate more robustly. There are also studies on robustness formed by the variables used in the study (Bourkhis and Nabi, 2013; Demirgüç, et.al, 2011; Gluzmann and Gluzmann, 2017; Khallouli and Nabi, 2013; Koç and Karahan, 2017; Kumar et al. 2012; Masruroh and Siraj, 2016; Moyo, 2018; Park, 2012; Schaeck and Cihák, 2010; Steinbacher et al. 2016; Varlık and Varlık, 2016). These studies can be briefly summarized as follows;

Varlık and Varlık (2016) investigated the effect on banking stability index formed by the Principal Component Analysis in their study of the perception of risk on the banking sector in Turkey. On the other hand, Koç and Karahan (2017) described the stable performance of banks as financial soundness and examined the factors affecting their financial soundness. Bourkhis and Nabi (2013) argued that financially sound banks will be particularly less affected by financial crises. For this purpose, they measured the financial soundness of banks with Z-score and compared the financial soundness of participation banks and conventional banks. Additionally, Steinbacher et al. (2016) measured the financial soundness of banks by their response to a shock, and this reaction by the rate of default of their loans. Experienced in Turkey and considered against the twin crises of 1994 and 2000 crisis Khallouli and Nabi (2013) reported measure of bank soundness and the durability. The authors used Markov's Switching Regime model in the study. To eliminate the disadvantages of this model, as a second model, the Banking system used the predictability of financial vulnerability indicators proposed by Abiad (2003). Similarly, Gluzmann and Gluzmann (2017) investigated whether financial crises are affecting banking soundness. As a result of the study, it was concluded that financial crises are an important factor in determining banking soundness. Schaeck and Cihák (2010) investigated whether the competition in the banking sector increased the robustness of banks'

operations. They measured competition using Boone's (2008) competition measurement method. At the end of the study, it was concluded that the competition in the banking sector in some European countries and the USA caused the banking activities to be more robust and it was seen more clearly in small banks. Moyo (2018) developed his work by adding another variable. He investigated whether efficiency as well as competition improved the resilience of banks' operations.

Moyo (2018) measured the competition with Boone and Lerner indices and robustness with the Z score. Consistent with the other studies mentioned above, it is seen that competition in bank activities increases the robustness. Demirgüç et.al. (2011) examined the impact of Basel Basic Principles on the soundness of banks. It was determined that the robustness of banks increased in line with Basel Basic Principles, thus creating a positive image by moving the Z score of banks away from the critical threshold. Kumar et al. (2012) measured the robustness of the banking sector in India using CAMELS rating parameters. CAMELS measures robustness with six parameters (capital adequacy, asset quality, management soundness, earnings, liquidity, and sensitivity to market risk). The first letters of these six parameters give the model its name. It is understood that private banks in India are financially more robust than public banks. Masruroh and Siraj (2016) compare the strengths of Panin Bank, which operates according to the principles of interest-free banking in Indonesia, before and after going public. Risk Based Bank Rating (RBBR) method was used in the study. RBBR method consists of Risk Profile, Good Corporate Governance, Earnings and Capital (RGEC) variables. In the study, it was seen that the strength of Panin Bank before the public offering has changed over the years. However, it was concluded that the strength of the public offering stabilized, did not vary over the years, and in summary, the public offering contributed to the strength of the bank.

Studies conducted in different countries have dealt with different aspects of financial soundness especially in banks. The effect of the soundness of banks on the financial performance of banks was investigated in this study. It is seen that there are generally studies on banking soundness and competition, financial stability, and productivity in the literature. The study is unique in terms of the dependent variables discussed and the method used in the analysis (Kónya causality test), and it is expected to contribute to the literature with these aspects. In addition, while the banking soundness index is generally used in studies conducted in Turkey, the financial soundness index has been used only in a limited number of studies (Selimler and Karadağ, 2020; Eyüboğlu and Eyüboğlu, 2018; Koç and Karahan, 2017). With this aspect of the study, it is expected to contribute to the literature.

3. Data and Methodology

In this part of the study, the analysis made to investigate the effect of soundness of banks on their financial performance is included.

3.1. Purpose of the Study and Data Set

The causality relationship between the Banking Strength Index (BSI) and the profitability of banks and market values was investigated by panel data analysis in this study. also, data for the period 2005-2019 were used. Banks included in the BIST Banking Index are included in the study. Turkey Industrial Development Bank A.Ş. (TSKB) is not included in the study. Because it is partially different from conventional banks in terms of its activity structure. The 11 banks included in the analysis are shown in Table 1.

Table 1. Banks Used as Sample in The Study

Abbreviation	The name of the Bank
AKBNK	Akbank T. A.Ş.
ALBRK	Albaraka Türk Katılım Bankası A.Ş.
DENIZ	Denizbank A.Ş.
GARAN	T. Garanti Bankası A.Ş.
HALKB	Türkiye Halk Bankası A.Ş.
ICBCT	ICBC Turkey Bank A.Ş.
ISCTR	Türkiye İş Bankası A.Ş.
QNBFB	QNB Finansbank A.Ş.
SKBNK	Şekerbank T. A. Ş.
VAKBN	Türkiye Vakıflar Bankası Türk Anonim Ortaklığı
YKBNK	Yapı ve Kredi Bankası A.Ş.

Development Banks activities included in the BIST Bank index (XBANK) are not included in the analysis because they are different from commercial banks. The variables used in the study are presented in Table 2.

Table 2. Variables Used in The Study

Capital Adequacy and Asset Quality	Loans / Deposits	**Banking Strength Index (BSI)**
	Credit / Total Assets	
	Core Capital / Risk Weighted Assets	
	Deposits / Total Assets	
	Fixed Assets / Total Assets	
	Financial Assets (Net) / Total Assets	
	Assets / Equity	
	Liquid Active / Total Active	
Credit Risk	Net NPLs / Total Loan	
Non-Operating Income	Non-Interest Income / Total Assets	
	Non-Interest Income / Total Profitability	
Interest and Currency Risk	Up to Three Months Interest Sensitive Active / Up to Three Months Interest Sensitive Passive	
	Foreign Currency Net Position / Legal Equity	
	Foreign Exchange Losses / Total Sales	
	Financing Expenses / Total Deposits	
Profitability	Net Profit / Equity (ROE)	**Profitability Index (PI)**
	Net Profit / Total Assets (ROA)	
	Net Profit / Net Sales	
Market Value	Market Value / Book Value	**Market Value Index (MVI)**
	Price / Income	
	Profit Per Share	

As seen in Table 2; The Principal Components Analysis and Banking Strength Index were created by using the ratios in the groups of Capital Adequacy and Asset Quality, Credit Risk, Non-Operating Income, Interest and Exchange Rate Risk. This index was taken from the study conducted by Varlık and Varlık in 2016.

In addition, in order to use different profitability ratios, 3 profitability ratios in the Profitability group, Basic Components Analysis and Profitability Index were created. This index was expressed as Profitability ratios. In order to use different ratios that measure the market value, 3 ratios in the Market Value group were created with the Principal Components Analysis and the Market Value Index. Expressed as market value ratios in this index.

3.2. Model and Method

Profitability ratios and market value ratios are dependent variables while the Banking Strength Index is the independent variable in the analysis. Since two different dependent variables were used, two different models were established. Indexes were created with Principal Components Analysis.

Principal Component Analysis (PCA) reduces the dimensions of multiple interrelated variables by preserving the large amount of change in variables and using the covariance between data. In the method, it transforms p variables, which are the number of n measurements, which show a mutually dependent structure, into new variables equal to the linear vertical and k number of variables that are independent from each other. The method allows the data to be tightened by reducing the number of dimensions by highlighting the general properties in more than one variable (Jollife, 1986). The PCA method has several characteristic features (Yıldız, Çamurcu and Doğan, 2010: 210):

- It tries to find the strongest pattern in the data. So, it can be used as a pattern finding technique.
- Often the diversity of the data can be captured with a small set of sizes selected from the entire size set. Thus, size reduction processes using PCA provide the creation of smaller-sized data sets, so that techniques that are not suitable for high-dimensional data can work on this new data set.
- Since the noises in the data are weaker than the patterns, these noises can be cleared as a result of size reduction. This feature is particularly useful in both data mining and other data analysis algorithms.

The models used in the analysis are as follows:

$$PI_{i,t} = \alpha_0 + \alpha_1 BSE_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$MVI_{i,t} = \beta_0 + \beta_1 BSE_{i,t} + \varepsilon_{i,t} \quad (2)$$

Among the indices in the above equations, I and t represent banks and time dimension, and ε represents the error term. Here, PROFIT stands for profitability index (PI), MVI stands for market value index, and BSI stands for banking soundness index.

Investigation of cross-sectional dependency between banks is an important threshold in determining the tests to be used in panel data analysis. In addition, it is also important in determining whether a shock to be experienced in a bank will spread to other banks. In the conjuncture where the intensity of economic and financial integration increases, it is inevitable that cross-sectional dependency will emerge in the banking sector. Therefore, in the first step of the analysis, the cross-sectional dependency between banks was examined. Developed by Breusch and Pagan (1980) because the time dimension (T = 15) is higher than the cross-section dimension (N = 11) to investigate the presence of cross-sectional dependency; The *LM* test, which gives more consistent results, and the Cross-Section Dependence CD_{LM} tests developed by Pesaran (2004) were used. The set of equations for LM and CD_{LM} is as follows:

$$y_{i,t} = \alpha_i + \beta_i x_{i,t} + \varepsilon_{i,t} \quad (3)$$

In the equation, i and t indices express the cross-section size and time, respectively. The null hypothesis representing no dependence between horizontal sections, while $H_0 : Cov\left(\varepsilon_{i,t}, \varepsilon_{j,t}\right) = 0$, the alternative hypothesis representing that there is a dependency between horizontal sections is $H_1 : Cov\left(\varepsilon_{i,t}, \varepsilon_{j,t}\right) \neq 0$. The equation calculated for LM test statistics is as follows:

$$LM = T \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{i,j}^2 x_{N(N-1)/2}^2 \quad (4)$$

and the equation calculated for CD_{LM} is as shown below:

$$CD_{LM} = \left(\frac{1}{N(N-1)}\right)^{1/2} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \left(T\,\hat{\rho}_{i,j}^2 - 1\right) N(0,1) \quad (5)$$

Another important aspect to be determined in the second step of the analysis is the homogeneity of the slope coefficients. Because, under conditions of high financial integration, the assumption of homogeneity in the causality relationship between banks' profitability and market values and BSI may be misleading. To examine the slope homogeneity of the coefficients, the $\tilde{\Delta}$ (Delta) test developed by Pesaran and Yamagata (2008) was applied. The equation used in test statistics calculations is as follows:

$$\hat{\Delta}= \sqrt{N}\frac{N^{-1}\tilde{S}-k}{\sqrt{2k}} \tag{6}$$

$$\hat{\Delta}adj = \sqrt{N}\frac{N^{-1}\tilde{S}-E(\widehat{Z_{i,t}})}{\sqrt{Var}(\widehat{Z_{i,t}})} \tag{7}$$

The null hypothesis showing that the slope coefficients are homogeneous in the $\tilde{\Delta}$ test is $H_0: \beta_i = \beta$, while the alternative hypothesis showing that the slope coefficients are not homogeneous (heterogeneous) is $H_1: \beta_i \neq \beta$.

After determining that the series are heterogeneous, it is necessary to take into account the cross-sectional dependency and the heterogeneity of the slope coefficients. For this reason, it is more appropriate to use the panel bootstrap causality method developed by Kónya (2006). Thus, more effective results can be obtained (Menyah et al., 2014: 391). According to the Kónya (2006) panel bootstrap causality test approach, the following equations are estimated (Kónya, 2006: 981):

$$y_{i,t} = \alpha_{1,1} + \sum_{i=1}^{ly1}\beta_{1,1,i}y_{1,t-i} + \sum_{i=1}^{ky1}\gamma_{1,1,i}x_{1,1,t-i} + \varepsilon_{1,1,t}$$
$$y_{N,t} = \alpha_{1,N} + \sum_{i=1}^{ly1}\beta_{1,N,i}y_{N,t-i} + \sum_{i=1}^{ky1}\gamma_{1,N,i}x_{1,N,t-i} + \varepsilon_{1,N,t} \tag{8}$$

and

$$x_{i,t} = \alpha_{1,1} + \sum_{i=1}^{ly1}\beta_{1,1,i}y_{1,t-i} + \sum_{i=1}^{ky1}\gamma_{1,1,i}x_{1,1,t-i} + \varepsilon_{1,1,t}$$
$$x_{N,t} = \alpha_{1,N} + \sum_{i=1}^{ly1}\beta_{1,N,i}y_{N,t-i} + \sum_{i=1}^{ky1}\gamma_{1,N,i}x_{1,N,t-i} + \varepsilon_{1,N,t} \tag{9}$$

In the equations; y denotes the dependent variables profitability and market value in two different models, x denotes the banking soundness index, N denotes the number of observations (j = 1,…., N) and t (t = 1,…., T) denotes the period. This test is based on the Wald test and the Seemingly Unrelated Regression (SUR) estimation method with the bank-specific bootsrap critical values. The method in question has some advantages over other causality tests. As a first advantage, the panel does not require a single hypothesis for the entire panel. Therefore, this situation makes it possible to perform causality testing separately for each panel located horizontally, assuming that the panel is heterogeneous. Another advantage is that it does not require preliminary tests such as cointegration and unit root tests (Kar et al., 2011). This method makes it possible to obtain individual bootstrap critical value for each bank (Kónya, 2006: 979). The lag length in the analysis was determined according to the Schwarz Bayesian Criterion as suggested in Kónya (2006) study.

3.3. Empirical Findings

Findings regarding the cross-section dependency and homogeneity tests are given in Table 3. LM (Breusch, Pagan 1980), CDLM (Pesaran 2004) and CD (Pesaran 2004) tests were applied to test whether there is cross-sectional dependency among variables. According to the test results, the null hypothesis $[H_0 : Cov\left(\varepsilon_{i,t}, \varepsilon_{j,t}\right) = 0]$ representing no dependency between cross sections was rejected at 1% and 5% significance levels, and it was concluded that there was cross section dependence in the model. The null hypothesis ($H_0: \beta_i = \beta$) showing that the slope coefficients are

homogeneous according to the results of the $\hat{\Delta}$ and $\hat{\Delta}_{adj}$ homogeneity tests was rejected at the 1% significance level. The slope parameters of the variables in the model were found to be heterogeneous.

Table 3. Cross Section Dependency and Homogeneity Tests

	PI	***MVI***	***BSI***
Horizontal Section Dependence			
LM	108.495*** (0.000)	151.852*** (0.000)	104.986*** (0.000)
CD_{LM}	5.101*** (0.000)	9.234*** (0.000)	4.766*** (0.000)
CD	-1.819** (0,034)	4.171*** (0.000)	-1.817** (0,032)
Homogeneity			
$\hat{\Delta}$			2.891*** (0.002)
$\hat{\Delta}_{adj}$			3.208*** (0.001)

Note: ** and *** show the 5% and 1% significance level, respectively.

Kónya (2006) Bootstrap panel causality test results, which are used to determine the causality relationship between banks' profitability and market value with the Banking Strength Index (BSI), are presented in Table 4 and Table 5.

Table 4 shows the causality results between banks' profitability and BSI. First of all, "H_0: BSI is not the cause of Profitability" hypothesis was tested. H_0 hypothesis was accepted at alternative significance levels for both each bank in the panel and for the entire panel. Therefore, there is no causality from BSI to Profitability.

Tablo 4. Panel Causality between Profitability and BSI

Banks	***H_0***: BSI is not the cause of Profitability.				***H_0***: Profitability is not the cause of BSI.			
	Statistics	***Critical Values***			***Statistics***	***Critical Values***		
		%1	***%5***	***%10***		***%1***	***%5***	***%10***
AKBNK	16.591	185.950	67.447	37.965	21.241*	90.665	35.913	19.859
ALBRK	1.746	306.884	132.397	83.729	0.035	774.84	268.775	166.852
DENIZ	1.757	198.983	75.028	46.737	15.774	315.547	114.917	69.492
GARAN	2.031	248.691	88.539	52.655	17.78	538.96	193.564	109.872
HALKB	5.327	26.227	12.397	7.962	70.297**	102.2	40.263	24.924
ICBCT	19.168	192.374	74.947	44.278	90.607*	324.97	116.366	65.88
ISCTR	5.912	221.348	85.673	52.23	5.325	898.005	361.026	215.755
QNBFB	5.406	223.14	79.04	45.237	70.93	749.522	256.275	149.412
SKBNK	3.204	29.629	12.914	7.989	3.003	86.212	33.209	19.361
VAKBN	5.075	83.904	35.733	22.938	29.523	319.458	127.955	77.739
YKBNK	11.636	128.696	43.908	25.107	85.349**	166.691	58.61	33.571

Note: Critical values are derived from 10,000 Bootstrap replicates. *** means statistical significance at the 10% significance level, ** at the 5% significance level, and * at the 1% significance level.

Another hypothesis in Table 4 is "H_0: Profitability is not the cause of BSI". According to the results, H_0 for AKBNK and ICBCT banks was rejected at the 5% significance level. It was determined that there is a causality from Profitability to BSI in these banks. The same results were obtained for HALKB and YKBNK banks. Accordingly, the H_0 null hypothesis was rejected at the 10% significance level and a causality from profitability to BSI was determined in the relevant banks. The probability value of the Panel Fisher test statistic (0.033) calculated for the entire panel is significant at the 5% level. It was concluded that there is a causality from Profitability to BSI for the entire panel.

The results of the causality analysis between banks' market values (MVI) and BSI are presented in Table 5. First of all, "H_0: BSI is not the cause of MVI" hypothesis was tested. According to the

results, H_0 for ALBRK bank was rejected at the 5% significance level. Therefore, it was determined that there is a causality from BSI to MVI in the relevant bank. The same results were obtained for ISCTR and VAKBN banks. In this context, H_0 was rejected at the 10% significance level, and a causality from BSI to MVI was found in the relevant banks. The probability value (0.097) of the Panel Fisher test statistic calculated for the entire panel was found to be significant at the level of 10% and it was concluded that there was a causality from BSI to MVI for the entire panel.

Table 5. Panel Causality Between Market Value (MVI) and BSI

Banks	H_0: BSI is not the cause of MVI.					H_0: MVI is not the cause of BSI.			
	Statistics	***Critical Values***				***Statistics***	***Critical Values***		
		%1	***%5***	***%10***			***%1***	***%5***	***%10***
AKBNK	4.562	442.998	153.215	88.699		58.228**	67.938	29.272	18.682
ALBRK	220.256**	314.295	109.469	65.826		1.168	218.533	82.467	45.43
DENIZ	0.793	159.182	58.557	34.063		16.297	380.097	123.367	65.523
GARAN	25.982	406.746	134.814	79.18		50.219*	164.047	62.022	36.678
HALKB	5.153	186.757	73.697	47.754		21.898	281.018	105.689	61.822
ICBCT	0.004	236.965	81.213	46.025		168.998***	376.899	131.231	72.98
ISCTR	68.166*	260.388	88.922	49.852		3.457	84.877	42.301	29.2
QNBFB	8.175	198.417	71.333	38.631		0.11	854.035	251.4	132.409
SKBNK	1.627	127.202	40.806	24.051		0.004	263.012	83.824	45.525
VAKBN	139.803*	334.358	150.923	98.684		64.432*	277.916	113.209	52.488
YKBNK	37.213	286.703	97.933	58.039		37.319*	244.098	85.646	29.226

Note: Critical values are derived from 10,000 Bootstrap replicates. *** means statistical significance at the 10% significance level, ** at the 5% significance level, and * at the 1% significance level.

Another hypothesis in Table 5 is "H_0: MVI is not the cause of BSI". According to these results, H_0 was rejected at 1% significance level for ICBCT bank, 5% significance level for AKBNK bank, and 10% significance level for GARAN, VAKBN and YKBNK banks. It has been determined that there is a causality from MVI to BSI for these banks. In addition, a bidirectional causality relationship from BSI to MVI and from MVI to BSI was determined for the VAKBN bank. The probability value (0.004) of the Panel Fisher test statistic calculated for the whole panel is also significant at 1% level. It was concluded that there is a causality from MVI to BSI for the entire panel.

4. Conclusion and Discussion

The importance of banks for national economies is known. The development of real markets along with financial markets will stabilize the growth of national economies. The development of real markets along with financial markets will stabilize the growth of national economies. Therefore, we can state that there is a significant number of academic studies on banks in many countries.

The efficiency and effectiveness of the activities of banks depend on their soundness. Referring specifically to the 2001 crisis in Turkey, the main factors causing this crisis in the banking / finance sector seems to be. One of the main reasons of the crisis is the lack of soundness of bank activities. Banks that can achieve soundness in their activities will be able to maintain their continuity and reach their profitability targets more easily and will make a great contribution to the development of the country's economies.

In this study, the effect of soundness in banks' operations on their financial performance was investigated. 11 banks in the BIST Bank Index (XBANKA) were taken as a sample in the study. The period of the study is 2005-2019. In order to investigate the soundness of banks, the index variables used by Varlık and Varlık [26] in their study in 2016 were preferred. By using the variables in this index, banking soundness index was created with Principal Components Analysis. Profitability ratios and market value ratios are used as dependent variables. Kónya causality test was used as a method in the study.

As a result of the study, it was understood that the banking soundness index did not cause the profitability of the banks, on the contrary, the profitability of the banks caused the banking sound index. In other words, it can be said that as the profitability of banks increased, the banking soundness index also increased. Banks' profitability leads to banking soundness index is at 5% significance level for AKBNK and ICBCT banks, and 10% significance level for HALKB and YKBNK banks. In the second model, which includes the other dependent variable, it was observed that the change in the banking soundness index caused the change in the market value of the banks. This causality is at 5% significance level for ALBRK and at 10% significance level for ISCTR and VAKBN banks. It was observed that the change in the market value of the banks caused a change in the banking soundness index. This causality was found to be at a 1% significance level for ICBCT bank, 5% significance level for AKBNK, and 10% significance level for GARAN, VAKBN and YKBNK banks. In other words, it was concluded that the change in market value ratios and profitability ratios in banks will cause changes in the soundness of banks. In addition, it is seen that the change in market rates will cause changes in the soundness of banks.

In the light of these results, it is seen that the realization of this target by private enterprises, whose main objective is profit maximization, will be interpreted positively in terms of management and increase in their profitability will contribute to the soundness of their activities. In order for banks to increase their profitability, they need to extend more loans, which is their main activity, and for this they need to collect more deposits. In addition, banks should maximize their profitability by making accurate investment analysis in other activities besides their main activities. The increase in their profitability will cause the soundness of the banks to increase. In addition, banks' optimal decisions regarding investment / financing / dividend distribution decisions will increase the market value, which will result in the soundness of banks. It is observed that the soundness of the activities of banks also affects their market values.

The results of the study reveal similar results to Moyo (2018). In the studies reviewed in the literature, generally the increase in the soundness of the transactions caused the increase in profits. The difference of this study from the studies examined in the literature is that it is mutual causality. In other words, the increase in the soundness of banks causes an increase in profits, and the increase in their profitability improves their soundness. The number of countries in the study sample can be improved by increasing the number of variables in the banking soundness index and using a different method.

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