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Does Bank Size Affect The Bank Profitability? An Evidence From Borsa Istanbul (BIST), Turkey

Banka Büyüklüğü Banka Karlılığını Etkiler mi? Borsa İstanbul Türkiye'den Ampirik Bir Kanıt

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ÖZET

Bu araştırmanın amacı Borsa İstanbul (BIST)'da faaliyet gösteren bankaların büyüklükleri ile karlılık oranları arasındaki ilişkiyi analiz etmektir. Araştırmanın amacı çerçevesinde BIST'de faaliyet gösteren 13 adet bankanın 2005-2019 dönemi verileri analiz edilmiştir. Araştırmada karlılık göstergesi olarak özkaynak karlılık oranı (ROE) kullanılmıştır. Araştırmanın bağımsız değişkeni banka büyüklüğüdür. Banka büyüklüğü toplam aktifler, toplam özkaynaklar ve çalışan sayısı ile temsil edilmiştir. Araştırmanın kontrol değişkenleri kaldıraç oranı ve likiditedir. Araştırmada üç adet regresyon modeli ile değişkenler arasındaki ilişkiler tahmin edilmiştir. Analizlerden elde edilen sonuçlara göre toplam aktifler, toplam özkaynaklar ve çalışan sayısı karlılık oranı ROE üzerinde pozitif yönlü etkilidir. Bunun yanı sıra kontrol değişkenlerinden finansal kaldıraç oranı karlılık oranı ROE üzerinde negatif yönlü etkiye sahip iken likidite karlılık oranı ROE üzerinde pozitif yönlü etkiye sahiptir.

Keywords:

Profitability,
Size,
ROE,
Borsa Istanbul,
Banking

ABSTRACT

The aim of the research is to analyze the relationship between the size of the banks operating in Borsa Istanbul (BIST) and their profitability ratios. Within the scope of the research, the data of 2005-2019 period of 13 banks operating in BIST were analyzed. Return on equity ratio (ROE) is used as a profitability indicator in the research. The independent variable of the research is the size of the bank. Bank size is represented by total assets, total equity and number of employees. The control variables of the research are leverage ratio and liquidity. In the study, the relationships between variables were estimated using three regression models. According to the results obtained from the analysis, it is determined that total assets, total equity and number of employees has a positive effect on the ROE and influence ROE positively. In addition, financial leverage ratio influences ROE negatively while the liquidity ratio influences ROE positively.

1. INTRODUCTION

The banking sector is critical to the economic activities of countries and is generally accepted as one of the requirements of sustainable economic growth due to its financial intermediation function (Aladwan, 2015; Menicucci and Paolucci, 2016). Therefore, the stability of the banking system is a prerequisite for an effective financial system and economic growth. In particular, profitability is one of the main factors to ensure stability in the banking system (Phan et. al., 2020). After the global financial crisis of 2008, the issue of profitability of financial institutions attracted more attention from regulators, bank managers and academicians. (Ali and Puah, 2019). In this context, the issue of factors affecting bank profitability has become a high priority for stakeholders (Yazdanfar, 2013). In the prior studies (Bourke, 1989; Molyneux and Thornton, 1992; Demirgüç-Kunt and Huizinga; 1999; Athasanoglu et. al, 2008; Dietrich and Wanzenried, 2011; Doğan, 2013a; Adelopo et. al, 2018; Fidanoski et. al, 2018) many factors that affect bank profitability have been identified. While most of the research focuses on banks' internal factors (size, ownership structure) and external factors (inflation, interest, macroeconomic variables), it is seen that these studies focus on a single country or group of countries (Demirgüç-Kunt and Huizinga, 1999; Bennaceur and Goaied, 2008; Sufian and Habibullah, 2009; Flamini et. al, 2009; Alper and Anbar, 2011; Javaid et. al, 2011; Doğan, 2013c; Kevser, 2018).

While internal factors (factors stemming from micro and firm structure) and external factors (macroeconomic and factors that the firm cannot affect) affect bank profitability as a whole, the effects of these factors vary according to countries, financial systems and economic structure (Gounder and Sharma, 2012; Doyran, 2013). Accordingly, firm size is an internal factor and there are many studies examining the effect of firm size on profitability (Athanasoglou et. al., 2008; Becker-Blease et. al., 2010; Akinlo, 2012; Menicucci and Paolucci, 2016; Ali and Puah, 2019).

There is an extensive literature on bank profitability. Net profit, return on assets ratio and return on equity ratio are frequently used as profitability indicators in many studies (Molyneux and Thornton, 1992; Demirgüç-Kunt and Huizinga, 1999; Athanasoglou et. al. 2008; Olson and Zoubi, 2011; Tan and Floros, 2012; Siraj and Pillai, 2012; Doğan, 2013b).

There are many studies examining the relationship between firm size and profitability. However, the relationship between bank size and the profitability of the banks' has a limited number of research examining the scope of BIST in Turkey. In this context the aim of the study is to investigate the relationship between banks size which is internal factor and banks' profitability in the framework of 13 banks operating in Borsa Istanbul (BIST). In the study, data of the banks operating in BIST for the period of 2005-2019 were used and the relationship between bank size and profitability was estimated with three regression models. Return on equity ratio (ROE) is used as an indicator of bank profitability in accordance with the literature. Total assets, total equity and the number of employees are also included in the research as indicators of bank size. Financial leverage and liquidity are the control variables of the research.

Turkish banking sector is the primary factor of financial system and economy. In Turkey 54 banks are operating with 11.295 branches and 203.114 employees. In Turkish banking sector total assets has increased %33 from December 2019 to September 2020 and reached to 6.004 billion TL. In the same period total equity has increased %15 and reached to 569 billion TL. Return on equity has increased from %8,47 to %9,07.

The Turkish banking sector appears to be the most important mechanism in terms of its volume in the economy and its effect on economic growth. In this respect, profitability indicators are important. Changes that may occur in internal factors can be effective on profitability (Alper and Anbar, 2011). For this reason, the results to be obtained from the research are important for bank managers, regulatory institutions, shareholders and academicians.

The study consist of five sections. The first section includes introduction. In the second section literatüre review and hypothesis development have take place. In third section of the study methodology has been presented. In the fourth section findings are included. In the fifth section findings were discussed and results were also presented.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

In the literature, bank profitability is generally defined as a function of internal and external determinants. Studies show that many descriptive variables are used to explain the determinants in both categories. It is seen that the studies examining the relationship between internal variables and bank profitability use variables such as firm size, capital, risk management and expense management as variables (Huang, 2020, Abdelaziz et. al., 2020).

Especially size has been used to determine the market share in developing economies or economies of scale (Athanasoglou et. al., 2008). Adusei (2015) states that large banks benefit from the advantages of economies of scale, thereby large banks increases their profitability. On the other hand, Kosak and Cok (2008) state that big banks (to-big-to-fail) control the markets through regulations together with their brand and image. In this context, it is claimed that a positive relationship is expected between bank size and profitability (Kosmidou, 2008; Adusei, 2015). Menicucci and Paolucci (2016) analyzed the 2009-2013 data of 35 European banks with regression analysis and found a significant relationship between bank size and profitability. Ali and Puah (2019) analyzed the 2007-2015 period data of 24 banks operating in the Pakistani banking sector with the balanced panel data analysis method. In the study in which firm size is measured by the natural logarithm of total assets, return on equity ratio was used as a profitability indicator. In the research, it was concluded that bank size has a significant and positive effect on profitability. On the other hand, there is no relationship between liquidity and profitability. However, Phan et. get. (2020) could not detect a statistically significant relationship between bank size and liquidity and profitability. Adelopo et. al (2018) found that bank size and liquidity had an effect on profitability, but that the financial crisis did not affect the relationship between bank-specific determinants and profitability. Okuyan and Karataş (2017) stated that equity adequacy and asset size have a positive effect on profitability. In the research, it was also stated that the increase in profitability depends on the capital adequacy, which is considered as an internal factor. Javaid et. al, (2011) analyzed the data of 10 banks in Pakistan for the 2004-2008 period using the ordinary least squares (OLS) method and reached the conclusion that total assets and equity are effective on profitability. As seen in the past studies on the subject, there are many studies in which the size of the firm or bank is measured by the natural logarithm of total assets, the natural logarithm of total equity and the number of employees (Al-Omar and Al-Muttari, 2008; Becker-Blease, 2010; Olson and Zoubi, 2011; Doğan, 2013a, Adelopo et. al, 2018; Fidanoski, et. al, 2018; Ali and Puah, 2019).

Although there are many studies on the existence of positive relationships between variables in the studies analyzing the relationship between firm size and profitability, there are also studies that do not detect a relationship between size and profitability or reveal the existence of a negative relationship. Sufian and Habibullah (2009) analyzed the data of Bangladesh banks for the period 1997-2004 with linear regression models and reveal that bank size does not have the same effect on variables. Eichengreen and Gibson (2001) state that the impact of bank size on profitability may be limited. Accordingly, size can have a negative effect on profitability due to bureaucratic reasons. Therefore, the relationship between size and profitability can be expected to be non-linear. Athanasoglou et. Al, (2006) analyzed the data of 1998-2002 period of banks operating in Southeast European countries and concluded that all variables except liquidity significantly affect bank profitability. Al-Omar and Al-Mutairi (2008) investigated the impact of bank-specific determinants on banks's profitability in the Kuwaiti banking sector by using regression models for the period 1993-2005. The results indicate that equity ratio and total assets explain % 67 of profitability. According to the study the positive impact of the size variable indicates scale efficiency meaning that there is a potential for higher profits as the size of banks increases.

As can be seen in the literature on the subject, the internal factors affecting profitability have been empirically examined in detail and previous studies have revealed that bank size (Berger et. al, 1987; Bikker and Hu; 2002) and liquidity (Bourke, 1989; Molyneux and Thorton, 1992) are important factors on bank profitability.

At this point, a main hypothesis and three sub-hypotheses have been developed in accordance with the relevant literature.

H_1: Bank size is effective on bank profitability.

H_{1a}: The bank's total assets are effective on the bank's profitability.

H_{1b}: The bank's total equity is effective on bank profitability.

H_{1c}: The number of bank employees is effective on bank profitability.

In the methodology section of the study, regression models for hypotheses were developed and relationships between variables were predicted.

3. METHODOLOGY

Although many studies have been conducted on the effect of firm size on profitability, this research has investigated the effect of the size of BIST banks on bank profitability. In this respect research has been

differentiated in terms of Turkey. In the research, the data which belongs to 13 banks operating in BIST (Akbank, Albaraka Türk, Denizbank, Garanti Bankası, ICBCT, İş Bankası, QNB Finansbank, Şekerbank, Halkbank, Development Investment Bank of Turkey, TSKB, Türkiye Vakıflar Bankası Anonim Ortaklığı, Yapı Kredi) between the years 2005-2019 has been used. The data of the research has been obtained from the Finnet database, web sites of The Banks Association of Turkey and Participation Banks Association of Turkey. In the research, the relationships between variables were analyzed by using multiple regression models, as well as correlation analysis. The strenght of the predicted models is revealed by F statistics. The variables and the definitions' of the variables used in the study are summarized below.

Table 1. Dependent, Independent and Control Variables of the Research

Research's Variables	**Description**
Dependent Variable	
Return on Equity (ROE)	Net profit after tax/equity
Research's Independent Variables	
Firm size – 1 (ASSETS)	Total Assets of Bank ***(ln)***
Firm size – 2 (EQUITY)	Total Equity of Bank ***(ln)***
Firm size – 3 (NUMBER OF EMPLOYEES)	Total employees of bank
Control Variables	
Leverage	Total liabilities/total assets
Liquidity	Liquid assets/total assets

In the research profitabiliry has been presented as ROE. In this research bank size indicators have been used as main independent variables. As firm size indicators total assets, total equity and number of employees have been used. Leverage ratio and liquidity ratio have been also used as control variables of the research. The variables used in the study were selected in accordance with the literature and are based on the assumption that they affect the bank profitability. The estimated regression models were developed on the basis of the relevant literatüre (Doğan, 2013a, Reis et. al, 2016) and these models are given below. The variables related to bank size are also analyzed with three different models.

Model I: $(ROE)it = \beta it + \beta 2\ ASSETS\ it + \beta 3\ LEVERAGE\ it + \beta 4\ LIQUIDITY\ it + eit$

Model II: $(ROE)it = \beta it + \beta 2\ EQUITY\ it + \beta 3\ LEVERAGE\ it + \beta 4\ LIQUIDITY\ it + eit$

Model III: $(ROE)it = \beta it + \beta 2\ EMPLOYEES\ it + \beta 3\ LEVERAGE\ it + \beta 4\ LIQUIDITYit + eit$

Table 2. Descriptive Statistics

	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
ROE	195	-49,56	40,44	14,3994	8,93567
Assets	195	20,35	26,87	24,3578	1,59820
Equity	195	18,93	24,80	22,2206	1,46992
Number of employees	195	285,00	25157,00	9748,60	7367,25661
Leverage	195	,00	15,48	8,5885	2,63157
Liquidty	195	3,40	53,30	25,8527	10,02807
Valid N (listwise)	195				

Table 2 shows that the average return on equity ratio of banks operating in BIST was 14.39% for the periods analyzed. The average of total assets, total equity and number of employees, which are the variables of bank size, for the analyzed periods are respectively 24.35%; It is 22.22% and 9.748.60.

4. FINDINGS

Table 3. Correlation Matrix

		ROE	Assets	Equity	Number of employees	Leverage	Liquidity
ROE	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	195					
Assets	Pearson Correlation	**,102**	1				
	Sig. (2-tailed)	,158					
	N	195	195				
Equity	Pearson Correlation	**,128**	,979**	1			
	Sig. (2-tailed)	,074	,000				
	N	195	195	195			
Number of employees	Pearson Correlation	**,152***	,876**	,897**	1		
	Sig. (2-tailed)	,033	,000	,000			
	N	195	195	195	195		
Leverage	Pearson Correlation	**-,130**	,327**	,187**	,184**	1	
	Sig. (2-tailed)	,070	,000	,009	,010		
	N	195	195	195	195	195	
Liquidity	Pearson Correlation	**,147***	-,114	-,060	,058	-,254**	1
	Sig. (2-tailed)	,041	,112	,405	,420	,000	
	N	195	195	195	195	195	

**Significance level is at 0.01 (2-tailed).
*. Significance level is at 0.05 (2-tailed**).**

The results obtained from the correlation analysis are shown in Table 3. Correlation analysis indicate that positive and statistically relation has been determined at 0,05 levet between ROE and liquiditiy and also number of employees. In other words a positive relationship between ROE and assets and also equity has been determined but significance is at low level. Apart from these result negative and statistically insignificant relationship between ROE and leverage has been determined as a result of correlation analysis.

Table 4. Results of Regression Analysis (ASSETS)

Model 1	**Unstandardized Coefficients**		**Standardized Coefficients**		
ROE	**B**	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	-6,657	9,994	-	-,666	,506
Assets	,927	,416	,166	2,226	**,027****
Leverage	-,517	,260	-,152	-1,990	**,048****
Liquidity	,113	,065	,127	1,743	**,083***
F-Statistic	3,721				
Adjusted R^2	0,40				

***, **,* respectively significance values at the level of 1%, 5% and 10%

According to the analysis results presented in Table 4, we can express Model 1 mathematically as follows;

Model I: *(ROE)it= βit+ (,166) ASSETS it + (-,152) LEVERAGE it + (,127) LIQUIDITY it + eit*

When Model 1 analyzed assets, leverage and liquidity which are the independet varibles of the study influence banks' profitablity. A positive relation between total assets and profitability (ROE) of the banks has been determined. From this point it can be said that if total assets increase also profitablity increases. A negative relation has been determined between leverage and ROE but a positive relationship between liquidity and ROE has been determined according to Model 1. These results also show that if the leverage gets higher than profitability decreases. If liquidity increases than profitability also increases.

Table 5. Results of Regression Analysis (EQUITY)

Model 2 ROE	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-6,264	9,807	-	-,639	,524
Equity	,971	,435	,160	2,231	**,027****
Leverage	-,437	,251	-,129	-1,741	**,083***
Liquidity	,110	,065	,123	1,698	**,091***
F-Statistic	3,728				
Adjusted R^2	0,40				

***, **,* respectively significance values at the level of 1%, 5% and 10%

According to the analysis results presented in Table 5, we can express Model 2 mathematically as follows;

Model II: (ROE)it= βit+ (,160) EQUITY it + (-,129) LEVERAGE it + (,123) LIQUIDITY it+eit

In model II it was determined that equity which is the independet variable of the study has a positive impact on denepndent variable ROE. But in terms of control varibles results are mixed. The leverage which is the indicator of debt level influences ROE negatively. If the banks' leverage rates increase whereas ROE of the banks decreases. Contrary, liquidity -second control variable of the study- influences ROE positively. In other words when liquidity increases also ROE increases.

Table 6. Results of Regression Analysis (NUMBER OF EMPLOYEES)

Model 3 ROE	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	13,982	3,084	-	4,534	,000
Number of employees	,000	,000	,172	2,388	**,018****
Leverage	-,461	,252	-,136	-1,832	**,068***
Liquidty	,091	,065	,102	1,398	,164
F-Statistics	3,978				
Adjusted R^2	0,44				

***, ** and * indicate significance at the level of 1%, 5% and 10%

According to the analysis results presented in Table 6, we can express Model 3 mathematically as follows;

Model III: *(ROE)it= βit+ (,172) EMPLOYEES it + (-,136) LEVERAGE it + (,102) LIQUIDITY it + eit*

When Model III is analyzed, it is seen that independent variable "number of employees" affects the banks' profitability. A positive relationship between number of employees and banks' profitability has been determined. In this context the profitability indicator of the research ROE increase when number of employees increase. But as the second model there is negative relationship between leverage and ROE. Leverage influences ROE negatively in model III. In addition to these findings there is a positive relationship between liquidity and ROE the same as model II.

DISCUSSION AND CONCLUSION

The purpose of the research is to analyze the affect of bank size on banks' profitability. In accordance with this purpose, data of 13 banks operating in BIST were analyzed for the period of 2005-2019. In the study ROE was use as the indicator of profitability. The independent variable of the research is the size of the bank, represented by total assets, total equity and number of employees. In addition, leverage and liquidity ratios were used as control variables in the study.

The results of the research show that all the determinants of firm size (total assets, number of employees and total equity) affect the banks' ROE which is the indicator of profitability positively in all three models. This may explained by the fact that banks which have bigger size tend to be more profitable. And also it can be concluded that large banks gain advantages from economies of scale. In this respect the results of the study are relevant with Kosak and Cok (2008), Kosmidou (2008), Adusei (2015). The results obtained from the study are also smilar with Athanasoglou et.al (2006). As Athasanoglou et. al. (2006) stated, all variables affect banks' profitability

significantly except liquidity. In three models of the study all independent variables also affect banks'profitability. But differently in this study liquidity also affect banks' profitability. From this point, differences between samples, periods and countries of the studies may cause different results.

On the other hand results are consistent with Berger et. al, 1987; Molyneux and Thorton, 1992; Bourke, 1989; Bikker and Hu; 2002; Al-Omar and Al-Mutairi (2008), Javaid et. al, (2011), Menicucci and Paolucci (2016), Okuyan ve Karataş (2017), Adelopo et. al (2018), Ali and Puah (2019). According to the results larger assets, equity and number of employees provide higher profitability. Therefore, in the context of Turkey operating with larger assets and equity of banks is recommended.

In three models of study it was determined that leverage affects ROE negatively and while liquidity affects positively. These results show that in order to increase profitability, leverage ratio should be reduced and banks should continue their activities with higher liquidity.

Limitations of the study: The study also has some limitations. First limitation is about the context of sample. The results can not be generalized and should only be considered within the framework of BIST of Turkey. Secondly the study covers the time period of 2005-2019. Thirdly, the results were obtained by using regression models. Different models can generate different results.

Practical implications: Banks operating in BIST are key financial institutions for Turkish economy. Because of this results are very important espacially for bank managers and policy makers. First of all bank managers should analyze the optimum level of assets and equity, by considering the dynamics of their own banks. Optimum asset and equity structure tends to be higher profitability. In addition to this, policy makers should analyze the impacts of mandotary regulations to banks' profitability such as asset ratio etc. which are applied in Turkish banking system recently.

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