Analysis of the Factors that Determine the Profitability of the Deposit Banks in Turkey

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Abstract

This study investigated the effects of internal factors under the control of deposit banks in Turkey and external factors that reflect the financial system in countries and that are beyond the control of the banks on the profitability of the banks. For this purpose, a multilinear regression analysis was carried out using the data of Turkish deposit banks of the period between 2008 and 2014. As a result, it was determined that there is a high correlation between the asset profitability and equity profitability of the banks, and micro variables are more effective in the determination of a bank's performance when compared to macroeconomic variables. It was further detected that liquidity, which is determined as a macro variable, has a negative effect on equity profitability, and the expense management of the bank is the only variable affecting a bank's profitability and equity profitability. Findings obtained as a result of the analysis carried out will help banks develop policies on the internal and external factors determining the profitability performances in order to be able to increase their efficiency in the financial system.

1 Introduction

Banks have a serious importance in terms of the strength of the financial system and protection of its healthy structure. Among the monetary system regulators of a country, deposit banks have functions such as funding, using funds and rendering services. However, the goal of the deposit banks to make profit is an important attribute that separates them from other financial institutions. High attention is given to the banking sector in our country. Therefore, it is crucial for the banks to function without any problems in the system. But the Turkish banking couldn't achieve the development it deserved due to some negativities. Turkish banks have to cope with risks such as credit, rate and liquidity risks as

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much as all the banks within the financial system. Credit risk is the most important of the financial risks in terms of the Turkish banking sector and it must be managed well. For the deposit banks in Turkey, being reliable institutions depends on their supervision of the risks and minimization of their losses by running the risk management beneficently. Banks which can run the risk management in a healthy way can determine the size of their losses in possible crises and take the necessary precautions with the understanding of a correct management by estimating what the operational risks and credit risks can be. Learning right lessons from the crises experienced especially in the recent past helped the Turkish banking sector to overcome the crisis of 2011, which changed the dynamics of the world's economy, appeared in GDP amounts of the countries, will also affect the future substantially and has gained a global outlook, without any effects[1]. The reason is definitely the restructuring program. The reason and purpose behind the emergence of this program is summarized briefly in the first section. The literature regarding the analysis of profitability is relayed in the second section, the purpose of the study and the method were explained in the third section and the model analysis was conducted in the forth section. In the fifth section, the results of the study were evaluated.

There are some constraints in the study. 33 deposits banks in Turkey were included in the research as of 16.02.2015; three of them were state banks, eleven were private-capitalized banks, six were foreign-capitalized banks established in Turkey and six were foreign-capitalized private banks which opened branches in Turkey (bat, 2015). Bank Of Tokyo-Mitsubishi UFJ Turkey A.Ş. (24 September 2013), Rabobank A.Ş. (4 September 2014) and Intesa Sanpaolo S.p.A. (4 June 2014) were authorized for operation by the BRSA; although these banks fall in the group of deposit banks, they weren't included in the study, because a full data set wasn't provided in a healthy way. Investment and Development banks, which had different characters, were excluded from the study.

Turkish Banking System Deposit Banks		
Public-Capitalized Deposit Banks	Private-Capitalized Deposit Banks	Private-Capitalized Foreign Deposit Banks
T. C. Ziraat Bankası A.Ş.	Adabank A.Ş.	Arap Türk Bankası A.Ş.
Türkiye Halk Bankası A.Ş.	Akbank T.A.Ş.	Bank Mellat
Türkiye Vakıflar Bankası T.A.O.	Anadolubank A.Ş.	Citibank A.Ş.
		Denizbank A.Ş.
	Şekerbank T.A.Ş	Deutsche Bank A.Ş.
	Tekstil Bankası A.Ş	Burgan Bank A.Ş.
	Turkish Bank A.Ş.	.
	Türk Ekonomi Bankası A.Ş.	Finansbank A.Ş.
	Türkiye Garanti Bankası A.Ş.	Habib Bank Limited
	Türkiye İş Bankası A.Ş.	HSBC Bank A.Ş.
	Yapı ve Kredi Bankası A.Ş.	ING Bank A.Ş.
	Fibabanka A.Ş	JP Morgan Chase Bank N.A.
		Sociéte Générale (SA)
		The Royal Bank of Scotland N.V.
		Turkland Bank A.Ş.
		Alternatif Bank A.Ş.

2 Turkish Banking System and Restructuring Program

The Turkish banking system became the most important agent of the crisis in February 2001 together with the effect of the financial fragility it bore as of the beginning of 1990s. The reason behind the crucial importance of the role the banking sector undertook during the crisis is the interest and rate risk carried by the sector and its poor asset quality. While the nominal rate anchor policy, which started to be implemented in 2000, pushed the banks towards a fund management using the open position, it caused the sector to also undertake the interest risk besides the rate risk as an inevitable result of the redundancy of the marketable securities' weight in their assets. The most significant elements that lead to an increase in the financial fragility in the sector are interest and exchange rate risks. The fact that the sector didn't have the necessary capital adequacy for carrying these risks made the banks resistless against the crisis. In sum, stability was sought with the "Banking Sector Restructuring Program" which was applied within the framework of "Transition to the Strong Economy Program (TSEP)" following the crisis in February 2001. Structural changes such as strengthening the financial and operational structure of the Turkish banking system, permanent settlement of the efficiency and competition within the system, restructuring of the public banks, reinforcing the regulative and supervisory frame,

strengthening the capital base of the sector and removal of the troublesome banks from the system with various methods through this program made the sector immunized to possible crises. It is assumed that the continuity of the profitability and efficiency in the banking system will gain more importance together with the success of the program. In this context, it is supposed that presentation of the profitability determinants in the banking system with an analytical study and the determination of the relationship between them will be useful.

3 Literature

Banks have a significant role in economy as primary financial intermediaries. Researches made on profitability determinants of the banks focused on the bank's net interest margins together with both the return on assets (ROA) and the return on equity (ROE)These researches generally investigated the effects of the banks' specific factors such as market power, risk and regulatory costs on the performance of the bank. However, researches have also been conducted on the effects of the macroeconomic factors on the performance of the bank recently.

In the literature, many studies investigated the determinants of the bank profits and margins in several countries worldwide. Usually measured by the return on assets (ROA) and/or the return on equity (ROE), bank profitability is generally represented as a function of internal and external determinants. Internal determinants comprise the factors which the decisions of a bank's management and policy targets affect primarily. The provisioning policy, capital adequacy, bank size, liquidity level and expense management constitute such determinants of profitability. On the other side, legal and economic environment, which is the duty area of the credit institution, are represented by the variables of industrial and macroeconomic external determinants.

Athanasoglou, Delis and Staikouras' study "The aim of Determinants of Bank Profitability in the South Eastern European Region" [2], conducted in 2006 - aimed at investigating the profitability manner of bank-related, industrial and macroeconomic determinants through an unbalanced panel dataset that belonged to the South Eastern European (SEE) credit institutions between 1998 and 2002. The following statement was presented in the study: "The enhancing financial reform and improvement levels in the structure of the credit institutions' combined balance sheet, are shared determinants of the bank profitability".

As stated by "The Determinants of Commercial Bank Profitability in Sub-Saharan Africa" that Flamini, McDonald and Schumacher [3] prepared in 2009, 389 banks from 41 SSA countries were used as a sample for investigating the determinants of the bank profitability. Except for the credit risk, higher returns on assets were presented to correlate with larger bank size, private ownership and activity diversification. As a consequence, macroeconomic variables influence the bank returns.

"Determinants of the Profitability of the US Banking Industry" of Hoffmann [4] investigates the profitability determinants of the US banks from 1995 until 2007. A negative relation is specified by the experimental findings between the capital ratio and profitability; this points at the statement related to the circumspective operation of the banks and their ignorance of commercial opportunities that are potentially profitable.

"Determinants of Bank Profitability in Nigeria", which belongs to Osuagwu [5] suggests that it is mostly the bank-related variables which determine the bank profit. In conclusion, the important factors in the bank profitability include internal organization and managerial efficiency.

In the study "Analysis of the Decisions on Growth, Size and Capital Structure on Profitability in the Turkish Banking Sector" of İskenderoğlu, Karadeniz, Atioğlu [6], the effect of size, growth and decisions on capital structure on profitability in commercial banks was analyzed. Permanence of the profits gained was determined with the meaningful and positive results given in all the models by the delayed values of return on assets and return on equity.

Starting from the importance of determining the variables that affect the profitability of the Turkish banks in terms of minimizing the effects of the crisis and enabling the continuity of financial stability in their study "Internal Determinants of Profitability in the Turkish Banking Sector", Alp, Ban et al. [7], showed that capital adequacy influenced the profitability of the Turkish banks in the positive direction.

Çerçi, Kandır and Önal [8] aimed in their study "Profitability Analysis in Banks: An Implementation on the Turkish Banking Sector" at researching the factors influencing the profitability of the deposit banks in Turkey and discovered with the multiple linear regression model that the Turkish deposit banks' return on assets, the ratio of the total credits to the total deposit and the ratio of the non-interest incomes to the total assets were influenced in the positive, the ratio of the non-interest expenses to the net profit was affected in the negative direction.

In a research, Bourke [9] Demirgüç-Kunt and Huizinga [10], Pasiouras and Kosmidou [11] determined variables such as bank's size and capital ratio as micro variables, and concluded that these affect the profitability of the bank positively.

In their study, Micco, Panizza and Yañez [12] considered the ownership structure of the banks as variables and determined that this variable affects profitability in line with the changes in the income status.

Dietrich and Wanzenried [13] implemented a model in which ROA was accepted as a dependent variable; and determined that concentration affects profitability by income positively (in low-income countries), and it affects profitability in countries with a high-income level negatively.

Ergün, Samırkaş and Evci [14] tested the bank-specific factors and macroeconomic factors that influenced the profitability of the deposit banks in Turkey through the multiple linear regression analysis with their study "Determinants of Profitability in the Turkish Banking Sector". It was found that the banks' return on assets and return on equity were influenced positively by the ratio of the non-interest incomes to the total assets and the equity/total asset ratio.

In Kaya's [15] study "Determinants of Profitability in the Turkish Banking Sector", an attempt was made to predict the profitability indicators of the banks through the two-staged approach of Ho and Saunders by using the micro variables in the panel data set and time dummy variables. Consequently, it was discovered that micro and macro variables determined the interest margin and return to asset variables with roughly similar weights and the decisiveness of the macro variables was higher in modeling of the return to equity.

Profitability-based performance has always been a popular subject in banking literature. Profitability has always been in the forefront for banks, which are the cornerstone of the financial structure. Thus, it is normal that it primarily attracts the attention of the researchers. The analysis of profitability-based performance can be carried out in various ways. However, the most basic approach is to find the variables affecting or determining profitability and to put forth the direction and level of their interactions with profitability. Although many studies were carried out in this area, the possibility to obtain different findings as a result of the properties of the period under investigation, different analysis

methods, and the fact that the operating characteristics and structures of the banks differ by country enable the re-examination of this subject [16].

4 Purpose and Method of the Study

With this study, it was aimed to reveal the effects of internal factors under the control of the bank such as capital adequacy, liquidity and the quality of the management affecting the profitability of the deposit banks in Turkey, as well as external factors such as inflation, interest rates on deposits, or GDP (Gross Domestic Product) on profitability. It was also aimed to carry out a multilinear regression analysis in order to reveal the relationship between ROA and ROE, and micro and macro variables used in the measurement of the profits to be obtained by banks as a result of their activities and the assessment of whether these profits are sufficient. Bank data from the period 2008-2014 were used in the assessment; the internal data that would be used in the research were provided from the statistical reports under the information of the BAT's bank and sector information, and the external data from the section of CBRT electronic data distribution system statistics.

Table: 1 Variables

CODE	NAME OF VARIABLE	EXPLANATION
DEPENDENT VARIABLE		
ROA	Profit Before Interest and Tax / Total Assets	Return on assets is utilized to find out how profitably the bank assets are used.
ROE	Net Profit (Loss) for the Period / Total Equities	Return on equity can be expressed with the profit share per each unit of the capital invested by the owner and partners of the bank.
INDEPENDENT VARIABLES (Micro)		
YKc	Operational Expenses/Total Assets	It is a variable related to management efficiency, that is, expense management.
SYOb	Equities/Total Assets	It is a variable demonstrating the part of the bank assets met with equities. A high rate points at a low borrowing level and a low rate at a high borrowing level.
AKTa	Financial Assets / Total Assets	It is a variable showing the asset quality of the bank.
LİKa	Liquid Assets / Total Assets	It is a variable that represents liquidity.
AKTb	Total Credits and Debts / Total Assets	It is a variable showing the risk of debt portfolio and bank asset quality.
INDEPENDENT VARIABLES (Macro)		
ENF	Price Index % Change (consumer)	Possible % change in the CPI may influence the profitability of the banks.
GDP	(% Change current) Growth	% Change in the GDP rate may affect the credit supply and demand. It is a variable that demonstrates where the relationship between this change and bank performances will be heading.
DIR	Weighted % Change with 1-month maturity	It shows how a positive change in deposit interest rates will be reflected on deposit amounts; profitability of the banks is influenced in the positive direction.

5 Analysis

Descriptive statistics are presented with mean (X), standard deviation (sd), minimum (min), maximum (max) values. Correlation analysis was implemented in order to discover the relationships between the variables, and then multiple linear regression analysis was performed to determine the relationships of the ROA and ROE variables with the YKc, SYOb, AKTa, LİKa, AKTb, Inflation Rate, GDP and DIR variables in two different models where the first two variables were designated as dependent variables; p values less than 0.05 were considered statistically significant. Analyses were performed with the SPSS 20.0 packaged software.

Table 2: Descriptive Statistics

Variables	n	X	sd	Minimum	Maximum
ROE	203	9.5987	10.41960	-72.75	37.23
ROA	203	1.7331	1.99262	-4.60	11.30
YKc	203	3.6450	2.22910	.30	15.50
SYOb	203	19.6911	19.21263	4.44	93.00
AKTa	203	20.2994	15.65160	.00	91.30
LİKa	203	41.1708	24.05519	8.59	99.81
AKTb	202	48.2000	22.31584	.00	84.70
Inflation rate	203	.0771	.01582	.06	.10
GDP Change	203	.0343	.04511	-.05	.09
DIR	203	.0943	.03589	.07	.18

Between 2008 and 2014, the ROE mean was found as 9.59±10.41, ROA mean as 1.73±1.99, YKc mean as 3.64±2.22, SYOb mean as 19.69±19.21, AKTa mean as 20.29 ±15.65, Lika mean as 41.17 ±24.05, AKTb mean as 48.20 ±22.31, inflation rate mean as 0.077± 0.015i, GDP change mean as 0.034±0.45 and DIR mean as 0.0943±0.035.

Table 3: Correlation Matrix

		YKc	SYOb	AKTa	LİKa	ROE	ROA	AKTb	Inflation rate	GDP Change	DIR
YKc	r	1									
	p										
SYOb	r	.651**	1								
	p	.000									
AKTa	r	.085	.077	1							
	p	.228	.273								
LİKa	r	.478**	.706**	.231**	1						
	p	.000	.000	.001							
ROE	r	-.305**	-.104	.221**	-.126	1					
	p	.000	.138	.002	.073						
ROA	r	.282**	.431**	.300**	.348**	.476**	1				
	p	.000	.000	.000	.000	.000					
AKTb	r	-.403**	-.643**	-.310**	-.886**	.031	-.413**	1			
	p	.000	.000	.000	.000	.661	.000				
Inflation rate	r	-.042	-.051	.052	.003	.003	-.069	-.022	1		
	p	.548	.473	.459	.967	.964	.328	.757			
GDP Change	r	-.184**	-.069	-.106	.006	-.010	-.163*	.034	.118	1	
	p	.009	.331	.134	.932	.888	.020	.629	.094		
DIR	r	.092	-.015	.132	-.021	.023	.011	-.024	.704**	-.153*	1
	p	.190	.830	.060	.763	.749	.880	.739	.000	.029	

** Significant at $p<0.01$, * Significant at $p<0.05$

The relationship between ROE and YKc is negative directional and significant ($r=-0.305$, $p<0.05$). The relationship between ROE and AKTa is positive directional and significant ($r=0.221$, $p<0.05$). The relationship between ROE and ROA is positive directional and significant ($r=0.476$, $p<0.05$). *(With the highest probability, these variables will be present in the regression model that will be obtained. Macro variables don't have an effect within the model.)*
There are no relationships between ROE and AKTb, SYOb, LİKa, Inflation Rate, GDP Change and DIR ($p>0.05$).
The relationship between ROA and YKc is positive directional and significant ($r=0.282$, $p<0.05$). The relationship between ROA and SYOb is positive directional and significant ($r=0.431$, $p<0.05$). The relationship between ROA and AKTa is positive directional and significant. The relationship between ROA and GDP Change is negative directional and significant ($r=-0.168$, $p<0.05$). The relationship between ROA and ROE is positive directional and significant ($r=0.476$, $p<0.05$). *(With the highest probability, these variables will be present in the regression model that will be obtained. Except for GDP, macro variables don't have an effect.)*
There are no relationships between ROA and AKTb, Inflation rate and DIR ($p>0.05$).

5.1 Determination of the Variables that Influence ROE and ROA

The regression analysis we implement must support three hypotheses to be valid statistically and mathematically. The first hypothesis is the high R^2 value ($R^2>0.4$), the second hypothesis is the significance of the determined mathematical model and the significance of the coefficients (ß) in the model. Because these variables are related to each other at a high level in ROA and ROE models, they exist in both models. The R^2 value is too low when extracted from the model.

Table 4: ROE and ROA Models

Model	Dependent Variable	Independent Variables	Corrected R^2	Model Significance	β	t	p
Model 1	ROA	ROE	0.51	F=52.203, p <0.05	.577	10.974	.000
		SYOb			.201	2.569	.011
		YKc			.244	3.550	.000
		AKTb			-.203	-3.132	.002
Model 2	ROE	ROA	0.47	F= 44.91, p<0.05	.635	11.413	.000
		YKc			-.463	-7.550	.000
		Years			-.170	-3.157	.002
		LİKa			-.124	-2.023	.044

Multiple linear models obtained as a result of the conducted regression analysis are given in the table above. while ROA is a dependent variable, ROE, SYOb, YKc and AKTb are independent variables in the 1st obtained model.The ability of the independent variables ROE, SYOb, YKc and AKTb to explain the variable ROA was found approximately as 51% (R^2=0.51). This proportion may be considered pretty adequate for such econometric models, but there is still a part unexplained by 49%. In order to test the significance of the mathematical model obtained, variance analysis was used. The model is significant according to the result of the variance analysis (F=$_{52.203}$, p <0.05). Finally, the coefficients of the independent variables in the model must also be statistically significant; it is observed as a result of the t-test conducted for this that all the coefficients (ß) in the model were significant. Consequently, the model supports all the hypotheses. According to the 1st model obtained as a consequence of the analysis,

Y (ROa)= 0.577*(ROE)+ 0.201(SYOb)+ 0.244(YKc)- 0.203(AKTb) was found.

ROE was discovered as the variable which had the biggest effect on ROA as per the model. 1-unit change in ROE will cause a 0.577-unit change in ROA when all other variables are kept fixed.One-unit change in YKc will lead to a 0.244-unit change in ROA.One-unit change in SYOb will cause a 0.201-unit change in ROA. One-unit change in AKTb will lead to a 0.203-unit reverse change in ROA. Briefly, AKTb influences ROA in the negative direction whereas the variables positively affecting ROA are put in order as ROE, YKc and SYOb in terms of their effects.

ROE is a dependent variable and ROA, Years (2008-2014), YKc and LİKa are independent variables in the 2nd model.The ability of the independent variables ROA, Years, YKc and LİKa to explain the variable ROA was found approximately as 47% ($R^2=0.47$). This proportion may be considered pretty adequate for such econometric models, but there is still a part unexplained by 53%. In order to test the significance of the mathematical model obtained, variance analysis was applied.The model is significant according to the result of the variance analysis ($F=44.91$, $p <0.05$).Finally, the coefficients of the independent variables in the model must also be statistically significant; it is observed as a result of the t-test conducted for this that all the coefficients (ß) in the model were significant. Consequently, the model supports all the hypotheses.

According to the 2nd model obtained as a result of the analysis,

Y(ROe)= 0.635*(ROa)+ -0.170 (Year) -0.463 (YKc) -.0124 (Lika) was found.

ROA was discovered as the variable which had the biggest effect on ROE as per the model. 1-unit change in ROA will cause a 0.635-unit change in ROE when all other variables are kept fixed.Increase in the year variable will lead to a 0.170-unit negative change in ROE. One-unit change in YKc will cause a 0.463-unit negative change in ROE. One-unit change in LİKa will lead to a 0.124-unit reverse change in ROE. Briefly, ROA was discovered as the only variable that affected ROE positively. YKc, Years and LİKa have negative influences.

The reason behind the negative determination of the year variable coefficient is ROE's tendency to decrease from 2008 until 2014. In other words, as long as the market conditions are stable, ROE's tendency to decrease in coming years can be observed at the confidence level by 95%.While YKc affects ROA positively in the first model, it influences ROE negatively in the second model.YKc was found as the only variable that affected ROA and ROE in two models.

6 Conclusion and Evaluation

Banking sector, which has a very importance place and size within the Turkish financial system, is a significant financial intermediary that collects the funds in the system and includes them in the system as credits again. Financial stability of the deposit banks in this sector and their ability to protect and maintain this strong structure will substantially contribute to enabling a quick economic growth and development. The global economic crisis, which especially started in the USA in the middle of 2007, affected the whole financial sector through byproducts, became a global crisis in a short time and forced the banks in many developed countries to declare loss between 2008 and 2012, didn't influence the Turkish banking system because of its strong asset quality, liquidity structure, capital adequacy, risk management and inclusion of internal control system.Micro and macro determinants that affect the profitability of the banks must be identified and reviewed so that the financial system can protect and maintain its healthy and steady structure. For this purpose, the relationships between the micro and macro variables, which determine the profitability of the banks, were identified and the multiple linear regression analysis was performed to determine the relationships of the ROA and ROE variables with the YKc, SYOb, AKTa, LİKa, AKTb, Inflation Rate, GDP and DIR variables in two different models where the first two variables were designated as dependent variables. It was discovered in

the 1st model as a result of the analysis that return on assets and return on equity were highly related to each other and return on equity was the variable which had the biggest effect on the banks' return on assets. It was found out that a change in the capital adequacy rate would influence the bank's return on assets. Accordingly, a stable and strong capital structure becomes inevitable if high and continuous performance is desired for the profitability of the banks. A change in the debt portfolio risk also causes a reverse change in the bank's return on assets. The variables that positively affect the banks' return on assets are their success to achieve efficiency in capital adequacy rate and management expenses. It was discovered in the 2nd model that return on assets was the variable which affected the return on equity in the positive direction and the most. In the 2nd model, the negative effect of the liquidity on the return on equity was also found. In other words, liquid asset increased by the banks decrease their profitability. Management efficiency was the only variable that affected ROA and ROE in both models. No relationships were found between return on equity, inflation rate, deposit interest rate and GDP in respect of macro determinants. However, a negative relationship was detected between the change in GDP and return on assets. In this sense, within the scope of the analysis results, the banks' restructuring of their capital adequacy rates as per the Basel II criteria will bring the potential depositors into safety and keep the banks strong against the fluctuation within the financial system. The increase in the number of profit-making banks will contribute to economic growth and financial stability will be maintained. The banks' beneficent handling of the management expenses, bearing operating expenses as least as possible and holding liquid assets at the lowest level will enable the banks to increase their profitability.

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