



The Determinants of Banking Sector Profitability in Turkey^{1,2}

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Abstract: Banking sector plays a crucial role in the financial system in terms of economic development of a country. The aim of this study is to investigate the determinants of the banking sector profitability in Turkey for the years between 1980 and 2017. We gather the data from the Turkish Statistical Institute (TurkStat) and The Banks Association of Turkey. In this context we use return on assets (ROA) and return on equity (ROE) as profitability indicators and form two models separately by taking them as dependent variables. We put both banking sector variables and control variables as independent variables. Within this framework we employ bank size, deposit conversion ratio, and liquidity as banking sector variables; whereas inflation rate, interest rate and exchange rate as control variables. To examine our models, we run a Regression Analysis. According to our findings, macroeconomic indicators such as inflation, interest rates and exchange rates play a significant role in shaping the performance of the banking system. However, banking sector variables such as assets, efficiency and liquidity are more crucial for profitability.

Keywords: Banking Sector, Profitability, Commercial Banks, ROA, ROE

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1. Introduction

Financial system can be considered as the most complex structure in the economic system. Banking sector plays an essential role in this structure. It has many critical functions such as being an intermediation channel that transfers money from lenders to borrowers and also as a creator of bank money. Furthermore, it funds to international trade, manages the risk on the international markets, affects income and wealth distribution. All these functions indicate the importance of banking sector and shows that a well-functioning banking sector is vital for a strong economy.

According to the banking regulation and supervising agency, the banking system of Turkey is based on four categories which include the deposit banks, investment banks, participation banks and banks under the supervision of savings deposit insurance fund. There are 53 banks in Turkey as of November 2018: 33 deposit banks (3 public deposit, 9 private deposit, 21 foreign deposit), 13 investment banks (3 public investments, 6 private investments, 4 foreign investment), 5 participation banks and 2 banks under the supervision of savings deposit insurance fund (Figure 1).

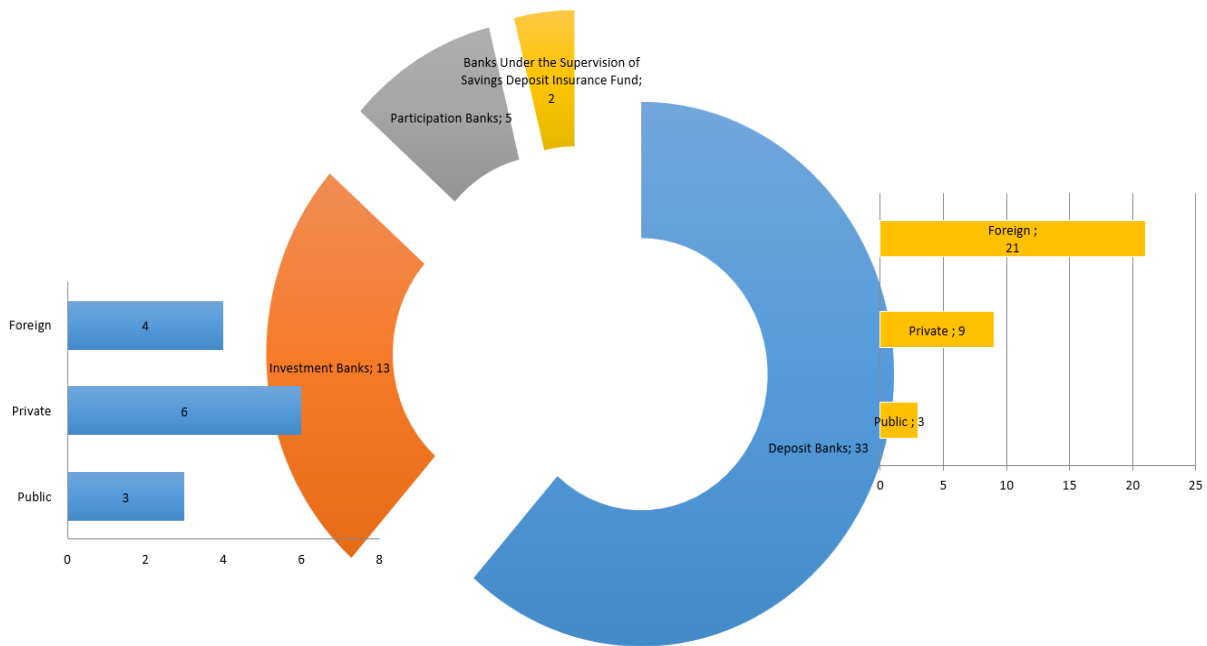
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Figure 1. Turkish Banking System



Source: The Banking Regulation and Supervising Agency

Profitability is the reason for companies to exist and banks are the institutions that operate for profit. And the system is extremely sensitive to the changes in both banking and macroeconomic indicators. So it is rapidly affected by the developments in the economy. The regulations made by the public authority, financial innovations and information technology opportunities allow the creation of a market that offers a wide range of alternatives to the both lenders and borrowers at the world level. The rapid developments in information technology cause to arise new financial products and services. Banks have been able to make more profit by lowering their financial transaction costs with the new financial products and services they offer to their clients (Coşkun et al., 2012). In this context, in this study our aim is to examine the determinants of the banking sector profitability. Within this framework, in the following section we give a brief literature review, in the third section we introduce our model and explain the findings. And finally we conclude our study with the results and discussion part.

2. Literature

In the literature, there are numerous studies that analyze the determinants of the profitability of banks, which is measured mostly by return on assets and return on equity. These two indicators are frequently stated as a function of endogenous and exogenous factors. Endogenous factors are the determinants such as capital adequacy, operational efficiency, size of the banks, liquidity, etc. Yet the exogenous factors are the macroeconomic determinants such as inflation rate, growth rate, exchange rate, unemployment rate, etc.

In this respect, Alper and Anbar (2011) aim to examine the bank specific and macroeconomic determinants of commercial bank profitability in Turkey for the period 2002-2010. They find that only real interest rate is positively related with profitability in regards to macroeconomic variables. Gündoğdu and Aksu (2011) investigate the short and long term relations between the profitableness of the deposit banks and the macro variables in Turkey. The results of the study show that real interest rates, consumer prices, consolidated budget deficit and industrial production affect bank profitableness in the long and short run. Kakilli and Çalim (2013) examine the bank specific and macroeconomic factors that affect the profitability of

commercial banks in Turkish banking sector for the years between 1998 and 2011. Empirical findings of the study suggest that the bank specific determinants have more effect on profitability of the commercial banks in Turkey than the macroeconomic factors. Table 1 shows the literature review including the data set, analyzed time period and the findings.

Table 1. Literature Review

Author(s) - Year	Data Set - Period	Positive Effect on Profitability	Negative Effect on Profitability
Bhattarai (2018)	17 commercial banks of Nepal over the period of 2011 to 2016	Capital adequacy ratio, Exchange rate, Annual inflation rate	Default risk, Cost per loan advanced, Annual GDP rate
Brahmaiah & Ranajee (2018)	89 banks in India between 2005-2015	Strength of equity capital, Operational efficiency, Ratio of banking sector deposits to the GDP	Cost of funds, Non-performing assets ratio, Consumer price index, Inflation
Ghurtskaia (2018)	Georgian banking sector during 2003-2017 years	Foreign direct investment	Gross domestic product, Inflation, Unemployment, Exchange rate
Hasanov et al. (2018)	22 Azerbaijani banks over the quarterly period from the first quarter of 2012 to the first quarter of 2017	Bank size, Capital, Loans, Inflation expectation, Oil prices	Deposits, Liquidity risk, Exchange rate devaluation
Satria et al. (2018)	Top 10 commercial banks in ASEAN over the period 2012 to 2016	Equity to asset	Loan to deposit, Investment to asset, GDP
Yüksel et al. (2018)	13 post-Soviet countries within annual data between 1996 and 2016	Non-interest income, Economic growth with profitability, Credit card fees and commission, GDP	Loan-to-GDP ratio
Başarır & Sarıhan (2017)	Deposit banks in Turkey between 1989 and 2015	Total credits / Total assets, Net profit / Total assets, GDP	Non-performing loans / Total credit, Inflation
Işık et al. (2017)	The factors that determine the profitability of Turkish banks for the period of 2006–2014	Bank capital, Net interest income Non-interest income, GDP	Credit risk, Liquidity management indicators
Topak & Talu (2017)	Banks in Turkey over the period 2005-2015	Real GDP, Interest rates, Operating expenses	Exchange rate, Credit risk, Capital adequacy
Pradhan (2016)	22 Nepalese commercial banks for the period 2005/06 to 2011/12	Credit to deposit ratio, Market share, GDP	Inflation, Liquidity, Non-performing loans
Sarıtaş, Uyar & Gökçe (2015)	Commercial banks in Turkey for the period between 2002 and 2013	Equity to total assets ratio, Total income to total costs ratio, Current period inflation ratio	Previous period of asset profitability (ROA(-1)), the rate of non-performing loans in total assets, previous year inflation rate
Osamwonyi & Michael (2014)	Banks in Nigeria from 1990-2013	GDP	Inflation, Interest rate
Bilal et al. (2013)	Commercial banks in Pakistan over the period of 2007 to 2011	Bank size, Net interest margin, Industry production growth rate, Real GDP on ROA, Capital ratio on ROE	Nonperforming loans to total advances, Inflation
Nahang & Araghi (2013)	Internal factors affecting the profitability of city banks in Iran between 2009-2012	Credit risk management, Cost Management	Amount of deposits, Loan payments, Amount of liquidity
Zeitun (2012)	Influential factors on Islamic and conventional banks in Gulf Cooperation Council countries, during the period 2002- 2009	Bank's equity, Foreign ownership, GDP	Size, Commercial Banks age, The cost-to-income ratio, Reserve Ratio, Inflation

Table 1. Literature Review (Continued)

Author(s) - Year	Data Set - Period	Positive Effect on Profitability	Negative Effect on Profitability
Gul et al. (2011)	The relationship between bank-specific and macro-economic characteristics over bank profitability over the period 2005-2009	Size, Loan, Deposits, Inflation, GDP	Market capitalization, Capital
Gündoğdu & Aksu (2011)	The relationship between the profitableness of the deposit banks and the macro variables between 1994 – 2008	Real interest rates on ROA, Consolidated budget deficit, Industrial production	Real interest rates on ROE, Consumer prices

In most of studies mentioned in Table 1, inflation rate has a negative effect on profitability, only just Bhattarai (2018) points to a positive effect. Hasanov et al. (2018) include inflation expectations in their model and find a positive effect. Nevertheless, majority of the studies find positive effect of Gross Domestic Product, while only Satria et al. (2018) determine a negative effect. The effect of interest rates, exchange rates, capital adequacy, bank size also varies for every country. In the light of all the literature mentioned above, we try to include as much banking sector and macroeconomic variables as possible into our model.

3. Empirical Analysis and Findings

We analyze the effect of banking and macroeconomic variables on banking profitability in Turkey between the years 1980 and 2017 on an annual basis. We gather the data from The Central Bank of the Republic of Turkey and The Banks Association of Turkey. We form the multivariate regression model as follows:

$$\Pi_t = \beta_0 + \beta_i X_{i,t} + \alpha_j C_{j,t} + \varepsilon_t$$

where $\Pi_t, X_{i,t}, C_{j,t}$ represent the profitability indicator, banking sector variables and macroeconomic (control) variables respectively. β_i, ε_t imply constant and error term of the model respectively and β_i, α_j point to coefficients. In the notation, t denotes the time period (number of observations). In this context we use return on assets (ROA) and returns on equity (ROE) as bank profitability indicators. As banking sector variables, we include the size of the bank, deposit conversion ratio, liquidity and efficiency. We add previous year's average interest rates, inflation rates (consumer price index – CPI) and Dollar/Turkish Lira (\$/TRY) exchange rates as macroeconomic variables. Table 2 shows all the variables and their definitions. We set two separate models for each profitability indicator.

Table 2. The Variables in the Model

Variable	Notation	Measure
Profitability	ROA	Net Income / Total Assets
Profitability	ROE	Net Income / Equity
Size	log(TA)	Log Assets
Deposit Conversion Ratio	DCR	Loans / Deposits
Liquidity	LIQ	Liquid Assets / Total Assets
Efficiency	EFF	Interest Expense / Interest Income
Inflation	CPI	Consumer Price Index
Interest Rate	I(-1)	Average Interest Rate
Exchange Rates	log(ER)	Log of Dollar/TRY Exchange Rate

For level values such as total assets and exchange rates, we take the logarithm of the values. Accordingly, descriptive statistics of the variables are illustrated in Table 3.

Table 3. Descriptive Statistics

	ROA	ROE	TA	LIQ	EFF	DCR	CPI	EX_RATE
Mean	0.0158	0.1845	260740	38.1058	0.6705	0.7710	40.8513	909914
Median	0.0200	0.1950	116210	36.2579	0.6774	0.7545	33.8650	426899
Maximum	0.0300	0.4700	820552	57.3388	0.9122	1.2091	125.5000	3771900
Minimum	-0.0300	-0.6200	18631	27.3249	0.4712	0.3499	6.1600	89
Std. Dev.	0.0129	0.2190	281637	7.8906	0.1297	0.2226	32.2166	1062471
Skewness	-2.3369	-2.1859	0.9253	0.9836	0.2458	0.2427	0.5980	1.0119
Kurtosis	9.1881	8.6064	2.2355	3.2053	1.9566	2.4828	2.4470	3.2630
Sum	0.6000	7.0100	9908134	1448.0210	25.4788	29.2986	1552.3500	34576715
Sum Sq. Dev.	0.0061	1.7747	3.E+12	2303.7040	0.6220	1.8338	38402.6100	4.18E+13
Observations	38	38	38	38	38	38	38	38

Firstly, we examine whether the model fulfills the prerequisites of the regression model or not. These conditions are linearity in the parameters, zero conditional mean, no perfect collinearity, homoscedasticity, no serial correlation, and normality. After we meet all the conditions for the regression, we run the model. In our first try, we find current year interest rate insignificant. Hence we exclude it from the model and include the previous year interest rates. The multivariate regression model analysis results are given in the Table 4.

Table 1. Regression Results

Independent Variable	Dependent Variables	
	ROA	ROE
C	-0.1094 (-4.834)	-0.7441 (-3.212)
LOG(TADOLAR)	0.0760 (6.511)	1,5180 (5.559)
DCR	0.0450 (3.621)	-
LIQ	0.0016 (7.555)	0.0173 (4.310)
EFF	0.0308 (3.101)	0.5446 (2.333)
CPI	0.0003 (3.333)	0.0047 (2.227)
I(-1)	-0.0005 (-3.684)	-0.0168 (-7.040)
LOG(EX_RATE)	0.0304 (2.361)	0.7096 (2.371)
R-squared	0.8539	0.7048
Prob(F-statistic)	0.0000	0.0000

The equations for the models can be illustrated as follows:

$$ROA = -0.109 + 0.076 \log(TA) + 0.045DCR + 0.002LIQ + 0.031EFF + 0.0003CPI - 0.001I(-1) + 0.030 \log(ER)$$

$$ROE = -0.741 + 1.518 \log(TA) + 0.017LIQ + 0.545EFF + 0.005CPI - 0.017I(-1) + 0.0709 \log(ER)$$

Previous year average interest rates affect negatively both ROA and ROE. This may be due to the fact that for 38 periods interest rates decreased in 24 of them when compared to the previous one. In other words, banks may have to convert the deposits they collect with high interest rates into loans with an interest rate that is very close to or lower than the deposit rate. Except interest rates, macro-economic variables have positive effects on profitability. On the contrary to the most of the research in the literature, as the way Athanasoglou et al. (2006) also find, our findings point to a positive effect of inflation rate on profitability. This indicates that the income of banks is higher than the cost of the banks. When the interest rates rise during the periods of high inflation, enterprises mostly prefer to finance their capital through the equity. This situation reduces the loan to deposit ratio of banks. Therefore, interest income of banks decrease in these periods. In order to cover these deficits, banks increase their commission fees for the banking transactions higher than the expected inflation rate during high inflation periods. Thus, the rise in the inflation rate leads to an increase in the incomes obtained from banking transactions, which is a type of bank income.

All of the banking sector variables affect positively both ROA and ROE. These results are consistent with the results of other studies in the literature. The bank size, for which we use total assets as proxy, is the most affecting factor in the banking sector. Deposit Conversion Rate is not significant in ROE model. This result will be more meaningful when examined together with the negative effect of the average interest rates on both equity and return on assets. During the examined years in which interest rates entered a downward trend, probably the mismatch of deposits and loans maturities cause the deposit conversion rate to have no significance on the return on equity since the banks could not convert the deposits collected into loans at the same time.

4. Conclusion and Recommendations

The aim of this study is to investigate the determinants of the profitability of banking sector in Turkey for the years between 1980 and 2017. We use return on assets (ROA) and returns on equity (ROE) as bank profitability indicators. As banking sector variables, we include the size of the bank, deposit conversion ratio, liquidity and efficiency and as macroeconomic variables; we add inflation, previous year average interest rates and exchange rates to the model.

According to the findings macroeconomic indicators such as inflation, previous year average interest rates and exchange rates play a significant role in shaping the performance of banking system. In our analysis, the current year interest rates are found to be insignificant, while the previous year interest rates affect negatively both ROA and ROE. However, the negative effect is bigger on ROE. It is well-known that equity is more delicate to changes in interest rates than assets.

However, banking sector variables such as assets, efficiency and liquidity are more crucial for profitability. The analyzed macro-economic variables and banking sector variables explain 85% of the ROA and 70% of the ROE. These results are quite significant. Recent studies in the literature point out that intellectual capital has an impact on the profitability of the banks. We believe that the unexplained part on ROA and ROE are probably related to the intellectual capital of the banks since it covers human capital, structural capital and relational capital (client capital)³. For further contribution to this study, intellectual capital as a variable on the model could be included.

End Notes

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2. *This paper is supported by Bandirma Onyedi Eylul University BAP Department. Project number: BAP-19-1009-016*
3. *See the details about Intellectual Capital in Çalışkan (2015)*

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