DETERMINANTS OF PROFITABILITY IN TURKISH BANKING SYSTEM

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ABSTRACT

DETERMINANTS OF PROFITABILITY IN TURKISH BANKING SYSTEM

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This thesis analyses the effect of sectoral and macroeconomic variables on the profitability of the Turkish commercial banks over the period 2005-2009:3 by using multiple regressions. In this study, profitability of Turkish banking system in the mentioned period is discussed and questions such as why some commercial banks are more profitable than others and to what extent discrepancies in banks' profitability are due to variation in endogenous factors under the control of bank management and to what extent external factors impact the profitability performance of these banks are sought to answer.

Firstly, the empirical results revealed that sectoral characteristics explain a substantial part of the within-country variation in bank interest margins and net profitability. High profitability tends to be associated with banks that hold a relatively high amount of equity capital, and with large non-interest income. Other important internal determinants of banks' profitability are non-interest expenses and fixed assets which have negative and significant impact. Also, equity capital is the internal determinant of net interest margin. Secondly, it is found that inflation is the macroeconomic determinant of net interest margin and profitability.

Keywords: Profitability, Net Interest Margin, Turkey

ÖZ

TÜRK BANKACILIK SEKTÖRÜNDE KARLILIĞIN BELİRLEYİCİLERİ

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Yüksek Lisans, Ekonomi Bölümü

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Bu tez, 2005-2009:3 döneminde bankacılık sektörüne özgü değişkenler ile makroekonomik değişkenlerin Türk ticari bankalarının karlılığı üzerine etkilerini çoklu regresyon tekniği ile analiz etmiştir. Çalışmada, söz konusu dönemde Türk bankacılık sektörünün karlılığı tartışılarak bazı bankaların neden diğerlerinden daha karlı çalıştığı, bankaların karlılıkları arasındaki farklılıkların ne ölçüde banka yönetiminin kontrolünde olan bankacılığa özgü değişkenlere bağlı olduğu ve dışsal değişkenlerin bu bankaların karlılığını ne ölçüde etkilediği gibi sorulara yanıt aranmıştır.

İlk olarak, ampirik sonuçlar sektöre özgü değişkenlerin net faiz marjı ve karlılıktaki ülke içi farklılıkların önemli bir kısmını açıkladığını ortaya çıkarmıştır. Yüksek karlılık bankaların özkaynaklarının nispeten güçlü olması ve faiz dışı gelirlerinin fazlalığı ile ilişkili bulunmuştur. Banka karlılığının diğer içsel belirleyicileri ise karlılık ile anlamlı ve negatif ilişki içerisinde olan faiz dışı giderler ve duran aktifler olmuştur. Ayrıca, özkaynakların net faiz marjının da içsel belirleyicisi olduğu saptanmıştır. İkinci olarak ise enflasyonun net faiz marjının ve karlılığın makroekonomik belirleyicisi olduğu sonucuna ulaşılmıştır.

Anahtar Kelimeler: Karlılık, Net Faiz Marjı, Türkiye

To My Mother

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ADF   : Augmented Dickey Fuller
AR (1)   : First Order Autoregressive
BAT   : Banks Association of Turkey
BRSA   : Banking Regulation and Supervision Agency
BTP   : Before Tax Profits
CAP   : Capital
CBRT   : Central Bank of Republic of Turkey
EBRD   : European Bank for Reconstruction and Development
FE   : Fixed Effects
FIX   : Fixed Assets
FX   : Foreign Exchange
GDP   : Gross Domestic Product
GLS   : Generalized Least Squares
GMM   : Generalized Method of Moments
GNP   : Gross National Product
INF   : Inflation
IPI   : Industrial Production Index
NII   : Non-interest Income
NIM   : Net Interest Margin
NPL   : Non Performing Loans
OCR   : Operating Cost Ratio
OLS   : Ordinary Least Squares
ROA   : Return on Assets
ROE   : Return on Equity
RE   : Random Effects
SEE   : South Eastern European
SDIF   : Saving Deposits Insurance
SP   : Securities Portfolio
TURKSTAT : Turkish Statistical Institute
US   : United States

CHAPTER 1

INTRODUCTION

Profitability is one of the main reasons for the existence of business enterprises, and business enterprises continue their operation by making profits. Banks are the business enterprises that aim to make profits similar to the others. In this regard, the profitability performance of the banks indicates the success of the banks' management. Turkish banking sector provides an interesting context for studying bank profitability because of two reasons. The first one is that the sector underwent significant changes with the restructuring program conducted after the November 2000 and February 2001 crises. With the success of the program, it is expected that the profitability and efficiency of the sector will become more important in the post-crises period (Kaya, 2002). The second reason is that although there is a global financial crisis in the world, Turkish banks continued to declare high levels of profits that attract attention of both domestic and foreign investors. These ideas constitute the main motivations of analyzing the determinants of profitability in Turkish banking sector.

Variations in endogenous factors under the control of bank management are investigated as causes of variation in profitability and the impact of external factors are analyzed. This study aims to shed light on the determinants of the profitability of the Turkish banking sector over the period 2005-2009:3 by OLS regression technique. Both sectoral and macroeconomic variables are used in this study. The sectoral variables are formed by the aggregated data of commercial banks in Turkey. The three performance measures used in this study are return on assets (ROA), return on equity (ROE) and net interest margin (NIM). We use six bank characteristics as internal determinants of profitability performance. They comprise the ratio of non-interest expenses to total assets (NIE), the ratio of non- interest income to total assets (NII), the ratio of equity capital to total assets (CAP), the ratio of

deposits to total assets (DEP), the ratio of fixed assets to total assets (FIX), and the ratio of securities portfolio to total assets. The two macro-economic variables used in this study are inflation (INF) and industrial production index (IPI). According to the empirical results, the ratio of non-interest expenses to total assets and the ratio of fixed assets to total assets are negatively; the ratio of non-interest income to total assets, the ratio of equity capital to total assets and inflation are positively related to return on assets and return on equity. Also, the ratio of equity capital to total assets and inflation are found to have positive relationships with net interest margin.

There are many other studies conducted in Turkey that deal with the profitability performance of the Turkish banking system. The reason of a high number of studies is that the profitability performance of Turkish banking sector remained important since the sector has been fighting against inflation for many years and has intense competitive requirements (Tunay and Silpar, 2006b, p.4). The other notable studies conducted in Turkey in this area are; Kaya (2001), Kaya (2002), Yıldırım (2002), Okumuş (2002a), Okumuş (2002b), Duvan and Yurtoğlu (2004), Günalp and Çelik (2006), Atasoy (2007), Bektaş (2007) and Abbasoğlu, Aysan and Güneş (2007). As in the case of our study, some of the international studies are conducted on a single country. The single country studies are divided into two groups as developed and emerging market studies in the literature. Berger (1995), Neeley and Wheelock (1997) and Angbazo (1997) are the studies conducted in United States, whereas Barajas et al. (1999), Afanasieff et al. (2002), Guru et al. (2002), Ben Naceur and Goaied (2001), Naceur (2003), Jiang et al. (2003) and Athanasoglou et al. (2005) are the examples of studies conducted in various developing countries. Among panel county studies, Demirgüç-Kunt and Huizinga (1999) forms basis to other studies. In a comprehensive study, Demirgüç-Kunt and Huizinga (1999) investigate the determinants of bank interest margins using bank-level data for 80 countries in the years 1988-1995. The set of regressors of this study include several variables accounting for bank characteristics, macroeconomic conditions,

explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and underlying legal and institutional indicators. Demirgüç-Kunt and Huizinga (2001), Molyneux and Thornton (1992), Abreu and Mendes (2002), Bashir (2000), Bashir and Hassan (2004), Athanasoglou et al. (2006) and Saunders and Schumacher (2000) are the other studies that explore the determinants of bank profitability on a set of developed countries.

In chapter 2, empirical studies that aimed at the determinants of profitability performance of the banks are summarized together with the applications on Turkish data. When we examine the empirical studies we see that the main variables used in the models are bank specific variables that are under the control of bank management and external variables that are not controlled by bank management and separated as macroeconomic and financial structure variables. In chapter 3, we describe the general structure of Turkish banking system in the period consistent with our empirical work. The asset-liability structure and profitability performance of the banks are examined in a time trend. In chapter 4, we discuss the data and variable definitions and present the empirical results. Finally, Chapter 5 provides a general evaluation of the study, our conclusions and policy implications.

CHAPTER 2

A SURVEY OF APPLICATIONS

There are many national and international studies that aimed at the determinants of profitability performance of the banks. Studies on the determinants of banks' interest margin and profitability have focused whether on a particular country or on a panel of countries. The single country studies are divided into two groups as developed and emerging market studies in the literature. Berger (1995), Neeley and Wheelock (1997) and Angbazo (1997) are the studies conducted in US whereas Barajas et al. (1999), Afanasieff et al. (2002), Guru et al. (2002), Ben Naceur and Goaied (2001), Naceur (2003) and Jiang et al. (2003) are the examples of studies conducted in various developing countries. Among panel country studies, Molyneux and Thornton (1992), Abreu and Mendes (2002), Bashir (2000), Athanasoglou et al. (2006) and Saunders and Schumacher (2000) explore the determinants of bank profitability on a set of developed countries, whereas Demirgüç-Kunt and Huizinga (2000) and (2001) are focused in both developing and developed countries. Kaya (2000) and (2001), Tunay and Silpar (2006a) and (2006b) and Atasoy (2007) are the studies in Turkey that are important for us. In this chapter, we will briefly mention the econometric specification and results of some studies.

2.1 Single Country Studies

In this section, we will provide a literature survey that consists of single country studies conducted on United States, Malaysia, Greece, Colombia, Tunisia, Hong Kong, India, Brazil and Malawi.

Berger (1995) examines the relationship between the return on equity and the capital asset ratio for a sample of US banks for the 1983-1992 time period.

Using the Granger causality model, he shows that the return on equity and capital to asset ratio tend to be positively related.

Angbazo (1997) studies the determinants of bank net interest margins for a sample of US banks using annual data for 1989-1993. The empirical model for the net interest margin is postulated to be a function of the following variables: default risk, interest rate risk, an interaction between default and interest risk, liquidity risk, leverage, implicit interest payments, opportunity cost of non-interest bearing reserves, management efficiency, and a dummy for states with branch restrictions.

The empirical specification focuses on the reported net interest margins (NIM) which is assumed to be a function of the desired (or pure) spread and bank-specific factors:

$$NIM_{it} = F(S_{it}*(.), X_{it,} \varepsilon_{it})$$

where NIM is the observed or reported net interest margins at time t. The function $S_{it}*(.)$ is the desired interest rate spread, or the pure spread between loan and deposit rates, which reflects the compensation for bank inventory risk arising from uncertainty about loan and deposit transactions. X_{it} is a vector of bank-specific characteristics which have an impact on the net interest margins, and the residual term ε_{it} is included to reflect all other market imperfections and regulatory restrictions affecting NIM.

The results for the pooled sample suggest that the proxies for default risk (ratio of net loan charge-offs to total loans), the opportunity cost of non-interest bearing reserves, leverage (ratio of core capital to total assets), and management efficiency (ratio of earning assets to total assets) are all statistically significant and positively related to bank interest margins. It is also revealed that the ratio of liquid assets to total liabilities, a proxy for low

liquidity risk, is inversely related to the bank interest margin and the other variables were not significant in statistical terms.

Guru et al. (2002) attempt to identify the determinants of successful deposit banks in order to provide practical guides for improved profitability performance of these institutions. The study is based on a sample of seventeen Malaysian commercial banks over the 1986-1995 period. The profitability determinants were divided in two main categories, the internal determinants (liquidity, capital adequacy and expenses management) and the external determinants (ownership, firm size and external economic conditions). The findings of this study revealed that efficient expenses management was one of the most significant factors in explaining high bank profitability. Among the macro-indicators, high interest ratio was associated with low bank profitability and inflation was found to have a positive effect on bank performance.

Athanasoglou et al. (2005) investigates the bank-specific, industry specific and macroeconomic determinants of the Greek commercial banks' performances during the period 1985-2001. The group of the bank-specific determinants of profitability involves operating efficiency, financial risk and size. Industry concentration and the ownership status of the banks are examined in the group of industry specific determinants and cyclical output and expected inflation in the group of macroeconomic determinants.

In specifying the model, they account for profit persistence using a dynamic panel data estimation procedure. The model augmented with lagged profitability is as follows:

$$\pi_{it} = c + \delta \pi_{i,t-1} + \sum_{j=1}^{J} \beta_j X_{it}^j + \sum_{l=1}^{L} \beta_l X_{it}^l + \sum_{m=1}^{M} \beta_m X_{it}^m + \varepsilon_{it}$$

$$\varepsilon_{it} = v_i + u_{it}$$

where π_{it} is the profitability of bank i at time t, with $i = 1,...N$; $t = 1,...T$, $\pi_{i,t-1}$ is the one-period lagged profitability, c is a constant term, δ is the speed of adjustment to equilibrium, X_{it}'s are the explanatory variables and ε_{it} is the disturbance with $v_i \sim IIN(0, \sigma_v^2)$, the unobserved bank-specific effect and independent of $u_{it} \sim IIN(0, \sigma_u^2)$, the idiosyncratic error. According to the model, a value of δ between 0 and 1 implies that profits persist, but they will eventually return to their normal (average) level. A value close to 0 means that the industry is fairly competitive (high speed of adjustment), while a value of δ close to 1 implies less competitive structure (very slow adjustment).

They estimated the above model using the generalized method of moments (GMM) estimator that is suggested by Arellona and Bond (1991) dealing with the biasedness and inconsistency of the estimates. The results of the study show that capital is important in explaining bank profitability and that increased exposure to credit risk lowers profits. Additionally, labor productivity growth has a positive and significant impact on profitability, while operating expenses are negatively and strongly related to it. According to the authors, this result shows that cost decisions of bank management are instrumental in influencing bank performance. They also state that the size and ownership status of the banks are insignificant in explaining profitability. The empirical results also show that concentration affects bank profitability negatively but insignificantly and finally, it is found that macroeconomic control variables, such as inflation and cyclical output, clearly affect the performance of the Greek commercial banks.

Barajas et al. (1999) document significant effects of financial liberalization on bank interest spreads for the Colombian case. According to them, although the overall spread has not reduced with the financial liberalization measures undertook in the early 1990s, the relevance of the different factors behind bank spreads was affected by such measures. They used banking system data for the 1974–88 (quarterly) and May 1992 to August 1996 (monthly)

periods for the aggregate system, and a panel of 22 banks for the March 1991 to August 1996 period. Related with the financial liberalization process, it is seen that changes in bank profitability resulted from the increase in loan quality after the reforms.

Jiang, Tang, Law and Sze (2003) investigate the determinants of the ratio of before tax profits to total assets using 14 Hong Kong banks' characteristics and macroeconomic variables over the period 1992-2002. Both fixed effects and random effects results for five different models are given in the study. Empirical analysis of the study reveals that both bank-specific and macroeconomic factors are important determinants of the profitability of banks. Among macroeconomic factors, real GDP growth, inflation and real interest rates are found to have a positive impact. With regard to bank-specific variables, it is observed that operational efficiency and business diversification leads to higher returns on assets, after controlling for differences in the credit quality of loans.

Ben Naceur and Goaied (2001) investigate the determinants of the Tunisian banks' performances during the period 1980-1995. The sample includes all deposit banks in Tunisia (11 banks). The performance drivers used in this study are productivity, bank size, bank portfolio composition, bank capitalization, bank quotation and stock exchange reform. Return on assets (ROA) and return on equity (ROE) are the two alternative measures of performance used in the study.

The parameters of the following model have been estimated using the unbalanced panel data regression (fixed effects):

$$Perf_{ij,t} = f(Prod_{ij,t}, Size_{ij,t}, Solv_{j,t}, Base_{j,t}, Quot_{j,t}, Fmark_t)$$

where $Perf_{ij,t}$ represents two alternative performance measures for the firm j during the period t; $Prod_{ij,t}$ represents two alternative productivity measures

for the firm j during the period t; $Size_{ij,t}$ represents three alternative size measures for the firm j during the period t; $Solv_{j,t}$ is a measure of firm j's capitalization; $Base_{j,t}$ is a measure of firm j's portfolio composition; $Quot_{j,t}$ is a measure of whether the firm j is quoted in the Tunis stock exchange or not during the period t and $Fmark_t$ is a stock market reform measure during the period t. The results indicate that the best performing banks are those who have struggled to improve labor and capital productivity, those who have maintained a high level of deposit accounts relative to their assets and those who have been able to reinforce their equity.

Naceur (2003) investigates the impact of banks' characteristics, financial structure and macroeconomic indicators on banks' net interest margins and profitability in the Tunisian banking industry for the 1980-2000 period. While studying the impact of banks' characteristics on their performance, Naceur (2003) include macroeconomic and financial structure indicators which are not included in Ben Naceur and Goaied (2001). Capital ratio, overhead, loan and liquidity ratios are used as proxies for internal indicators; inflation and growth as macroeconomic indicators. In the context of financial indicators, relative size that is calculated as the stock market capitalization divided to total assets of deposit money banks, stock market capitalization divided by GDP, the size of the banking sector that is measured by the ratio of total assets of the deposit banks to GDP, and bank concentration are used.

Relative size is used to examine how the performance of the banking sector is related to the relative development of the banks and stock markets. Stock market capitalization/GDP is used as a proxy of financial market development and as a measure of the size of the equity market. Size of the banking sector is intended to measure the importance of bank financing in the economy. The ratio of stock market capitalization to GDP and size of the banking sector may also indicate the complementarities or substitutability between bank and equity market financing.

The paper uses panel data regression analysis with random effects to find the underlying determinants of Tunisian banking industry performance. The linear equation relating the performance measures to a variety of factors is displayed in the following equation:

$$Per_{ij,t} = f(BC_{ij,t} + M_t + FS_t)$$

where $Per_{ij,t}$ represents two alternative performance measures for the firm j during the period t; $BC_{ij,t}$ are bank variables for bank j at time t; M_t are macro-economic variables and FS_t are measures of financial structure indicators.

The results include several specifications, with the basic specification including a set of bank characteristic variables. Subsequently, they add the macroeconomic variables and the financial structure variables. In this study high net interest margin and profitability are associated with banks that hold a high amount of capital, large overheads and loans. The empirical results indicate that the size has mostly negative and significant coefficients on the net interest margins suggesting that larger banks tend to lower margins and this is consistent with models that emphasize the negative role of size arising from scale inefficiencies. Also the author stated that concentration is less beneficial to the Tunisian commercial banks than competition since they see that the concentration ratio has a negative and significant impact only on net interest margin. Lastly, stock market development is found to have a positive effect on bank profitability. According to the author this reflects the complementarities between bank and stock market growth.

Gerlach, Peng and Shu (2004) examine the determinants of banking performance in Hong Kong over the period 1994-2002. They focused on the affects of macroeconomic developments on the two important profitability

measures, net interest margin (NIM) and non-performing loans (NPL). In their study Gerlach, Peng and Shu model NPL and NIM as follows:

$$NPL_{i,t} = f(MACRO_t, FIN_t, BANK_{i,t}) + error_{it}$$

$$NIM_{i,t} = g(MACRO_t, FIN_t, BANK_{i,t}) + error_{it}$$

where $MACRO$ denotes a set of macroeconomic variables, FIN denotes a set of financial variables and $BANK$ denotes bank specific variables. Five specifications for NPL and four specifications for NIM are estimated in this study. All equations are estimated twice, first with a common intercept and then allowing for fixed effects. According to the authors, results of the test for fixed or individual effects suggest that the fixed effects model should be chosen for estimation. Interaction between the determinants of profitability is allowed in some specifications.

Among the variables, GDP and nominal interest rates are found to be positively related to the NPL ratio. Besides, it is found that growth affects the NPL ratio of larger banks more than that of smaller banks. However, the results suggest that rises in inflation and property prices reduce the NPL ratio in Hong Kong. The negative effect of the inflation is explained by the erosion of the real debt burden that makes it easier for borrowers to meet their obligations when inflation is higher. On the other hand, economic growth, inflation, interest rates and operating costs are found to be the most important determinants of NIM. The empirical results indicate that economic growth and inflation lead to higher NIMs and NIMs are affected more from the macroeconomic developments in smaller banks since when there is an economic upturn, leading to increased loan demand, smaller banks expand lending more aggressively than larger banks and take more risk with higher returns. Also, operating costs are found to be positively related to NIMs and this is because banks may transfer the changes in operating costs to the customers by varying lending spreads or a higher NIM leads to a higher risk profile of loans that raises the operating costs related to the management of

the risk. Lastly, it is found that changes in interest rates affect smaller banks more than larger ones and the authors explain this result with the higher capital base of the smaller banks.

De (2003) analyses the effects of ownership on bank performance in India over the period 1997-2001. The measure of the profitability that has been used in this study is return on assets (ROA). The measures of efficiency used are net interest margin (NIM) and operating cost ratio (OCR). The control variables include the logarithm of total assets, proportion of investment in Government of India securities, the proportion of loans made to the priority sector, the proportion of rural and semi-urban branches and the proportion of non-interest income in total income.

The model used in testing for the presence of ownership effects on bank performance is as follows:

$$(Performance)_{it} = \mu + \delta' D + \beta' X_{it} + v_{it}$$

where $(Performance)_{it}$ is the performance measure for the ith bank during the tth period, D is a vector of dummy variables that characterize ownership, X_{it} is a vector of other control variables that might affect performance and v_{it} is a random error term. δ and β are the column vectors of the coefficients to be estimated. The elements of β characterize the ownership effects. The error structure of the model is given by the following:

$$v = u_{it} + \alpha_i + \lambda_t$$

$$u_{it} \sim N(0, \sigma_u^2), \ \alpha_i \sim N(0, \sigma_\alpha^2), \ \lambda_t \sim N(0, \sigma_\lambda^2)$$

A random effects model that controls for unobserved bank specific and time specific effects is used and the model is estimated using the technique of generalized least squares (GLS). De (2003) argues that the method of panel regression also takes care of the endogeneity problem to a certain extent. He

states that the probability of the presence of the endogeneity problem is very low since the choice of the ownership structure is policy driven and it has less frequently been the case that a poorly functioning bank is taken over by the government. Furthermore, any past period performance affecting future ownership is taken care of in this study since the regression technique uses data for several time periods.

The results of the study indicate that while logarithm of total assets does not have any significant effect in the ROA regression, it is found to have negative but significant effects in both the NIM and OCR regressions. In the case of the NIM regression, this points to a decline in interest spreads with the increase in scale and in the case of the OCR regression, the negative effect may be a result of the presence of fixed costs like insurance, lawyer's fees, auditor's fees, etc. It is observed that proportion of investment in Government of India securities has a negative significant effect on ROA, indicating the dampening effect of the low returns on government securities on profitability. According to the authors, the negative significant effect of this variable in the OCR regression is more a result of variable creation than anything else and this happens because investment in Government of India securities forms part of the assets of the banks and assets also form a part of the denominator of the dependent variable, thus, giving rise to the negative influence. They state that the proportion of loans made to the priority sector does not have any significant impact on ROA, which runs contrary to the popular belief that priority sector lending has a dampening effect on profitability. It is also seen to have a positive significant effect in the OCR regression, indicating to a certain extent, the higher network of branches generally associated with higher lending to the priority sector. Another important result of the study is that proportion of non-interest income in total income has a positive significant effect on ROA, confirming their earlier conjecture that non-interest income does have a positive effect on profitability whereas it does not have any affect whatsoever on NIM and OCR.

Afanasieff, Lhacer and Nakane (2002) make use of panel data techniques to uncover the main determinants of the bank interest spreads in Brazil. Monthly data for all the commercial banks operating in Brazil during the period from February 1997 to November 2000 is used in the study. The vector of bank characteristics includes number of bank branches, the ratio of non-interest bearing deposits to total operational assets, the ratio of interest-bearing funds to total earning assets, operating costs, bank liquidity, the ratio of service revenues to total operational revenues, the bank net worth, and bank leverage. The vector of macroeconomic variables contains the market interest rate, a proxy for risk premium, the inflation rate, the output growth rate, the required reserve ratio on demand deposits, and a financial taxation rate.

The empirical model to be estimated in this paper makes use of a panel data set for Brazilian banks to implement the two-step approach due to Ho and Saunders (1981). The equation used for the first step is as follows:

$$s_{it} = \delta + D\gamma + X_{it}\beta + \varepsilon_{it}$$

where s_{it} is the interest spread for bank i in period t $(i = 1,...,N; t = 1,...,T)$ measured as the difference between the loan and the deposit rates, D is a set of T time dummy variables taking the value one for period t, X_{it} is a vector of bank characteristics, ε_{it} is the statistical disturbance, and δ, γ, and β are parameters to be estimated. The measure of the pure bank spread is the estimate of $(\delta + \gamma_{t})$, where γ_{t} is the tth element in the γ vector and p_{st} denote the estimate of the pure spread.

In the second-step of the procedure, the following equation is estimated:

$$p_{st} = \varphi + Z_{t}\lambda + u_{t}$$

where Z_{t} is a vector of macroeconomic variables, u_{t} is the statistical disturbance, and φ and λ are parameters to be estimated. The results

suggest that macroeconomic variables are the most relevant elements in explaining bank interest spread in Brazil.

Chirwa (2003) investigates the relationship between market structure and profitability of commercial banks in Malawi using time series data between 1970 and 1994. He uses time-series techniques of cointegration and error-correction mechanism to test the collusion hypothesis and determine whether a long-run relationship exists between profits of commercial banks and concentration in the banking industry. The results obtained from the study support the traditional collusion hypothesis of a long-run positive relationship between concentration and performance. Chirwa (2003) states that the dynamic shortrun analysis also shows a high speed of adjustment in profitability from disequilibrium and indicates a positive response in profitability to a negative deviation from a long-run equilibrium.

2.2 Panel Country Studies

In this section, we will provide the studies that are conducted on a panel of countries. Demirgüç-Kunt and Huizinga (1999) and Demirgüç-Kunt and Huizinga (2001) formed basis to many other studies in this area.

Molyneux and Thornton (1992) were the first to explore thoroughly the determinants of bank profitability on a set of countries. They use a sample of 18 European countries during the period 1986-1989. They find a significant positive association between the return on equity and the level of interest rates in each country, bank concentration and government ownership. Besides, it is observed that capital, interest rates, personnel expenditures, concentration and government ownership have a positive relationship with return on assets while liquidity has an adverse effect.

In a comprehensive study, Demirgüç-Kunt and Huizinga (1999) investigate the determinants of bank interest margins using bank-level data for 80

countries in the years 1988-1995. The set of regressors include several variables accounting for bank characteristics, macroeconomic conditions, explicit and implicit bank taxation, deposit insurance regulation, overall financial structure, and underlying legal and institutional indicators. The variables accounting for bank characteristics and macroeconomic factors are of special interest since they are close to the ones included in the regression estimated in our study.

In this study, the regression analysis starts from the following equation:

$$I_{ijt} = \alpha_0 + \alpha_i B_{ijt} + \beta_j X_{jt} + \gamma_t T_t + \delta_j C_j + \varepsilon_{ijt}$$

where I_{ijt} is the dependent variable (either the net interest margin or before tax profits / total assets) for bank i in country j at time t, B_{ijt} are characteristics of bank i in country j at time t, X_{jt} are characteristics of country j at time t, T_t and C_j are time and country dummy variables, and ε_{ijt} is a white-noise error term. Several specifications of the above equation including different bank and country variables are estimated in the study.

The paper reports that the bank interest margin is positively influenced by the ratio of equity to lagged total assets, the ratio of loans to total assets, a foreign ownership dummy, bank size as measured by total bank assets, the ratio of overhead costs to total assets, inflation rate, and the short-term market interest rate in real terms. It is observed that the ratio of non-interest earning assets to total assets, on the other hand, is negatively related to the bank interest margin and all the mentioned variables are statistically significant. Output growth, by contrast, does not seem to have any impact on bank spread.

On another linked paper, Demirgüç-Kunt and Huizinga (2001) present evidence on the impact of financial development and structure on bank profitability using bank level data for a large number of developed and

developing countries over the period 1990-1997. They study these relationships more formally within a regression setting. The empirical framework extends the work in Demirgüç-Kunt and Huizinga (1999) on the determinants of bank profitability and interest margins to include indices of financial structure.

The basic regression equation used in this study is as follows:

$$I_{i,j} = a + bB_i + gX_j + d\,S_j + e_{i,j}$$

where $I_{i,j}$ is the independent variable (either Profit / Total Assets or Net Margin / Total Assets) for bank i in country j; B_i are bank variables for bank i; X_j are country variables for country j; S_j are financial development and structure variables for country j; and $e_{i,j}$ is an error term. Versions of the above model are estimated with either bank-level or country-level data. The study indicates that financial development has a very important impact on bank performance. Specifically, the study reports that higher bank development is related to lower bank performance (Tougher competition explains the decrease in profitability). Finally, the authors state that stock market development on the other hand, leads to increased profits and margins for banks especially at lower levels of financial development, indicating complementarities between bank and stock market.

Bashir (2000) examines the determinants of Islamic banks' performance across eight Middle Eastern countries for 1993-1998 period. A number of internal and external factors were used to predict profitability and efficiencies. The study use capital ratios, leverage, overhead, loan and liquidity ratios, and foreign ownership as proxies for internal measures. Meanwhile, macroeconomic indicators, taxation, financial structure, and country dummies are used as external measures.

A linear equation, relating the performance measures to a variety of indicators is specified. In this study, the subsequent regression analysis starts from estimating the following basic equation:

$$I_{ijt} = \alpha_0 + \alpha_i B_{it} + \beta_j X_{jt} + \gamma_t M_{ti} + \delta_j C_j + \varepsilon_{ijt}$$

where, I_{ijt} is the measure of performance (either non-interest return or before tax profit / total assets) for bank i in country j at time t; B_{it} are bank variables for bank i in country j at time t; X_{jt} are country variables for country j at time t; M_{ti} are stock market variables in country i at time t, and C_j are country dummy variables. α_0 is a constant, and $\alpha_i, \beta_j, \gamma_t$ and δ_j are coefficients, while ε_{ijt} is an error term.

Although the primary focus of this paper is the relationship between performance and bank internal variables, the inclusion of macro variables, stock market variables, and the country dummies is meant to control for cyclical factors that might affect bank performance. Several specifications of the above model are estimated in this study. Controlling for macroeconomic environment, financial market situation and taxation, the results show that higher leverage and large loans to asset ratios lead to higher profitability. The paper also reports that foreign-owned banks are more profitable than the domestic ones. There is also evidence that taxation impacts bank profitability negatively. Finally, it is observed that macroeconomic setting and stock market development have a positive impact on profitability.

Bashir and Hassan (2004) forms the basis for this dissertation as it is a comprehensive piece of literature covering every aspect of examining profitability in Islamic banks. Similar to Bashir (2000), Bashir and Hassan (2004) studied the determinants of Islamic baking profitability between 1994 and 2001 for 21 countries. Their figures show Islamic banks to have a better capital asset ratio compared to commercial banks which means that Islamic

banks are well capitalized. Also, they used internal and external banks characteristics to determine profitability as well as economic measures, financial structure variables, and country variables. They used, Net-non Interest Margin (NIM), which is non interest income to the bank such as, bank fees, service charges and foreign exchange to identify profitability. Other profitability indicators adopted were Before Tax Profit divided by total assets (BTP/TA), Return on Assets (ROA), and Return on Equity (ROE). They studied 43 Islamic banks.

Results obtained by Bashir and Hassan (2004) were similar to that of Bashir (2000) which found a positive relationship between capital and profitability but a negative relationship between loans and profitability. Bashir and Hassan also found total assets to have a negative relationship with profitability which amazingly means that smaller banks are more profitable. In addition, during an economic boom, banks profitability seems to improve because there are fewer nonperforming loans. Inflation, on the other hand, does not have any effect on Islamic bank profitability. Finally, results also indicate that overhead expenses for Islamic banks have a positive relation with profitability which means if expenses increase, profitability also increases (Bashir and Hassan, 2004).

Athanasoglou, Delis and Staikouras (2006) use annual bank level and macroeconomic data from seven South Eastern European (SEE) countries (Albania, Bosnia-Herzegovina, Bulgaria, Croatia, FYROM, Romania and Serbia-Montenegro) over the period 1988-2002. The ratio of loans to assets, the average loan loss provisions to total loans ratio, the average equity to assets ratio, the overheads efficiency ratio, average bank size and the foreign ownership are used as the bank-specific determinants. Concentration and EBRD index of banking system reform are the variables tested as industry related variables and inflation and real per capita income are tested as macroeconomic determinants.

To test the relationship between bank profitability and the bank-specific, industry related and macroeconomic determinants, they used an unbalanced panel data set of SEE credit institutions and estimated a one way error component model which is specified as follows:

$$\pi_{its} = c + \sum_{j=1}^{j} \beta_j X_{its}^j + \sum_{l=1}^{L} \beta_l X_{ts}^L + \sum_{m=1}^{M} \beta_m X_{ts}^M + \gamma D_{s-1} + \varepsilon_{its}$$

$$\varepsilon_{its} = v_i + u_{its}$$

where π_{its} is the profitability of bank i at time t for country s, with $i = 1,...N$; $t = 1,...T$; $s = 1,...,S$, c is a constant term, the X's are explanatory variables (grouped into bank-specific, industry related and macroeconomic determinants, j, l and m respectively) and ε_{its} is the disturbance, with $v_i \sim IIN(0, \sigma_v^2)$, the unobserved bank-specific effect and independent of $u_{its} \sim IIN(0, \sigma_u^2)$, the idiosyncratic error. D stands for the country-specific dummy variables.

They claim that there is a strong evidence that their specification follows a random effects model as the Hausman test indicates. In order to identify possible biases in the parameters due to endogeneity of some variables used, they have also considered two and three stage least squares (3 SLS) estimators, but they got the remarkably similar estimates as random effects. Lastly, due to the substantial differences that exist in the banking environments of the SEE countries, Athanasoglou, Delis and Staikouras (2006) tested for potential cross-country and time effects which might bias the estimates in unknown magnitudes and directions and found that only country specific dummy variables are needed, as the time effects are insignificant.

According to Athanasoglou, Delis and Staikouras (2006) the empirical results indicate that the ratio of loans to assets is positively and insignificantly, whereas the average loan loss provisions to total loans ratio is negatively and

significantly related to bank profitability. The authors argue that SEE banking system maintains an illiquid position to prevent failures and they should focus more on credit risk management. When ROA is used as the dependent variable, capital variable and the average bank size are found to have positive and significant coefficients. They state that the operating expenses variable presents a negative and significant effect on profitability implying a lack of competence in expenses management. Their findings show that foreign banks operating in SEE countries perform significantly better in terms of ROA and ROE than domestic banks. The empirical results of this study also show that concentration affects only the ROA positively and that EBRD index suggests a negative and significant effect on profitability indicating that reform causes banks to offer increasingly competitive margins on loans and deposits, which in turn lowers profitability.

Davis and Zhu (2005) seek to assess the effect of changes in commercial property prices on bank behavior and performance in 15 industrialized economies over the period 1989-2002. Loan growth rate, net interest margin, non-performing loan ratios (NPL), loan loss provisions (PROV) and return on assets (ROA) are used as the dependent variables. Bank-specific variables used in the study are loan-to-asset ratios, real loan growth rate (excluded in its own equation), capital strength, net interest margin (excluded in its own equation), bank size dummies, country dummies and the growth rate of real commercial property prices. Growth rate of real GDP, inflation and nominal short-term interest rates are used as the macroeconomic variables.

Their model specifications are as follows:

$$Y_{i,t} = f(MACRO_t, BANK_{i,t-1}, DUMMY, CPP_t) + \varepsilon_{i,t}$$

where $MACRO_t$ denotes the macroeconomic variables that reflect the state of the economy, $BANK_{i,t-1}$ are the lagged bank specific variables, $DUMMY$

represents country dummy variables and CPP are the commercial property prices. And the model specifications that take the size effect into account are:

$$Y_{i,t} = f(BANK_{i,t-1}, MACRO_t, DUMMY, CPP_t, SIZE_i, INTERACTIVE_{i,t}) + \varepsilon_{i,t}$$

For most of the estimation they use standard GLS panel estimation with random effects[1]. However, they state that the GLS panel estimation technique ignores the dynamic linkages between dependent and independent variables. As a robustness check, a lagged dependent variable in one set of estimates is included and the generalized method of moments difference estimator suggested by Arellano and Bond (1991) is used in the study. The results indicate that commercial property prices have a major impact on a wide range of bank performance variables, ranging from risk indicators to profitability and lending activity. The authors also stated that commercial property price movements have a smaller effect on the loan quality and provisions for small banks than for large banks and their profits are less geared to commercial property prices than are those of large banks.

Abreu and Mendes (2002) study the determinants of bank interest margins and profitability for some European countries for the period 1986-99. Three different variables are used as performance measure; NIM, ROA and ROE. The bank-specific variables used are market share, operating costs, capital to asset ratio and loan to asset ratio. Among the macroeconomic variables the inflation rate, the unemployment rate and the nominal effective exchange rate are used. Also, they use dummy variables to account for the range of permissible activities and existence of crises of the European Monetary System. They follow the methodology used by Demirgüç-Kunt and Huizinga (1999).

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[1]The choice of random over fixed effects is supported by the Hausman test in the study. Moreover, the study states that from a purely practical standpoint, the fixed effects approach is costly in terms of degrees of freedom.

The estimated equation is as follows:

$$\pi_{ijt} = \beta_0 + \beta_i B_{ijt} + \beta_j X_{jt} + \beta_j C_j + u_{ijt}$$

where π_{ijt} represents the net interest margin or ROA/ROE for bank i in country j at time t, B_{ijt} represents a vector of characteristics of bank i in country j at time t, X_{jt} is a vector of control variables for country j at time t, and C_j is a vector of country dummy variables.

The results of the study show that well-capitalized banks have lower expected bankruptcy costs and they can translate this advantage into profitability. Unemployment rate, that has negative coefficients in all regressions, is found to be a relevant macroeconomic variable. Also, the results of the study indicate that there is a positive relationship between inflation and bank profitability. According to the authors, the micro variables that are relevant to NIM are the ratios of operating costs, capital and loans to total assets and the inflation rate as the macro variable. A positive relationship is found between NIM and micro variables whereas there is a negative relationship between NIM and the inflation rate. According to Abreu and Mendes (2002), capital, loan and market share are found to be the bank-specific determinants; inflation and unemployment rate are the macroeconomic determinants of ROA. Total equity of banks and market share are found to be positively related to ROA, whereas unemployment and inflation rates are found to be negatively related to pre-tax profits.

Saunders and Schumacher (2000) examine the determinants of net interest margin of 614 banks across 6 EU countries and US over the period 1988-1995. The authors use the two-step approach developed by Ho and Saunders (1981) in their study. Net interest margin (NIM) is calculated as the ratio of the difference between interest income and interest expenses to the average interest bearing assets in this study. For each country, net interest margin is

regressed on the ratio of the difference between non-interest income and non-interest expenses to average assets, the ratio of non-interest bearing assets to average assets and the ratio of capital to total assets.

In all countries, the effect of net non-interest expenses on the net interest margin is found to be statistically significant and positive. The ratio of non-interest bearing assets to total assets is found to be positively related to net interest margin as expected. Besides, in most of the countries, it is revealed that increase in the ratio of capital to total assets leads to increase in NIM. In this study, the fixed coefficients obtained from the first regression are used as the independent variable in the second regression and searched for the effects of interest volatility on the pure interest margin. The results indicate that interest volatility is positively related to pure interest margin.

2.3 The Applications on Turkey

In this section, we will provide the studies that seek to reveal the determinants of net interest margin and profitability performance of Turkish banking system. Kaya (2001), Kaya (2002), Yıldırım (2002), Okumuş (2002a), Okumuş (2002b), Duvan and Yurtoğlu (2004), Tunay and Silpar (2006a), Tunay and Silpar (2006b), Günalp and Çelik (2006), Atasoy (2007), Bektaş (2007) and Abbasoğlu, Aysan and Güneş (2007) are the studies that we will focus on.

Kaya (2001) aims to analyze determinants of net interest margin in Turkey. This paper shows that under high inflation and high real interest rates, net interest margin is also high in Turkey. Kaya (2001) states that in terms of bank groups, private banks have higher interest spreads than state owned banks. The reason of relatively low interest spreads of state owned banks is explained by low credit interest rates resulted from their duties and dependence on deposits in funding rather than efficiency in bank intermediation.

In this paper, determinants of net interest margin are analyzed by OLS regression technique using monthly data. The NIM equation that is estimated in this study is as follows:

$$NFM = \beta_1 * MKC_t + \beta_2 * TV_t + \beta_3 * C\dot{I}D_t + \beta_4 * MMK_t + \beta_5 * VER_t + \beta_6 * LNFM_t + \beta_7 * DUM94 + \beta_8 * T + \varepsilon_t$$

where MKC represents banks securities / total assets, TV represents total bank assets / M2, $C\dot{I}D$ represents current account balance / central bank international reserve ratio, MMK represents the required reserve ratio, VER represents taxes, duties, charges and premium payable / total assets, DUM represents the 1994 financial crisis and T is the trend variable.

Regression results of the study demonstrate that higher reserve requirement leads higher net interest margin and there is a negative relationship between net interest margin and total bank assets / M2, which represents deepening, and competition in banking sector. Kaya (2001) indicates that current account balance / Central Bank international reserve ratio represents macroeconomic stability and deterioration of this ratio leads to widen in net interest margin. In this study it is observed that there is a positive relationship between banks securities / total assets and net interest margin. Regression results of this study also show that there is a positive relationship between interest rate spreads and equities / total asset ratio and the sign of the taxes, duties, charges and premium payable / total assets is positive in net interest margin equation. Finally, it is found that there is a positive relationship between required reserve ratio and net interest margin.

Kaya (2002) studies the determinants of net interest margin (NIM), return on assets (ROA) and return on equities (ROE) of privately and state owned banks during the period 1997-2000 in Turkey. A two step approach due to Ho and Saunders (1981) is applied to measure the relative importance of the

micro and the macro elements to determine profitability. According to the method, bank-specific variables and time dummy variables are used to estimate the profitability measures of banks in the first step. The sum of time dummy variable and constant variable coefficients obtained in the first step shows the pure profitability of the system. Pure profitability is used as a dependent variable in the second step in order to search for the macroeconomic determinants.

Estimated equation in the first step of the empirical study is as follows:

$$\mathrm{k}_{it} = \alpha + \delta \mathrm{D} + \beta \mathrm{X}_{it} + \varepsilon_{it}$$

In this equation, k_{it} is the dependent variable ($i = 1,...,n$ number of banks; $t = 1,...,T$ number of period) representing bank profitability; D is periodic (for T period) dummy variable vector, X_{it} is bank-specific variable vector and ε_{it} is the statistical error term. Coefficients obtained from estimation results are represented by α, δ, and β.

Pure profitability obtained from the above equation is calculated by the following formula:

$$\mathrm{sk}_t = \alpha + \delta_t$$

Pure profitability is explained by macroeconomic variables in the second step. The estimated equation in the second step is as follows:

$$\mathrm{sk}_t = \varphi + \gamma \mathrm{Z}_t + \mathrm{u}_t$$

In this equation; sk_t represents the pure profitability, Z_t macro variable vector and u_t error term. φ and γ are estimated coefficients.

According to the results of the first step, capital, liquidity, personnel expenses and market share are positively; deposits are negatively related to NIM. It is observed that capital, liquidity and loans have a positive; personnel expenses, deposits and net non-performing loans have a negative effect on return on assets. Also, the results indicate that capital, personnel expenses and deposits are negatively; securities portfolio, liquidity, loans, foreign exchange position and market share are positively related to ROE. When the three profitability measures are evaluated together, at the % 10 significance level, capital, liquidity, personnel expenses and deposits are found to be the micro determinants of bank profitability in Turkey. As mentioned above, in the second step, macro determinants of pure interest margin and pure profitability measures obtained from the results of first step are searched. According to the second step results, at the %10 significance level, inflation and consolidated budget deficit are found to be the macro determinants of profitability in Turkey.

Yıldırım (2002) analyses the efficiency performance of the Turkish banking sector between 1988 and 1999, a period characterized by increasing macroeconomic instability. The empirical results suggest that over the sample period both pure technical and scale efficiency measures show a great variation and the sector did not achieve sustained efficiency gains. It is also reported that the sector suffers mainly from scale inefficiency and scale inefficiency, in turn, is due to decreasing returns to scale. There are also reported differences in the efficiency performance of commercial banks with different ownership status. In addition, the relationships between profitability, asset quality, size and the two definitions of efficiency are considered in this study. The author concludes that efficient banks are more profitable, and pure technical efficiency and scale inefficiency are positively related to size. Also, the trend in the performance levels over the period suggests that macroeconomic conditions had a profound influence on the efficiency measures.

Okumuş (2002a) aims to demonstrate the distorting effects of inflation on the financial statements of Turkish banks, and the corresponding effects on measures of profitability performance. It is observed that after inflation adjustment the level of profitability in Turkish banking over the period 1989-1995, is lower (overall) with respect to profitability measures calculated using historical cost based financial statements. In addition to this, a significant change in ranking by bank group, according to profitability performance is noted in this study. According to the paper, this clearly reflects the importance of considering the potential distorting effects of inflation on the financial statements of Turkish banks. Also, Okumuş (2002b) investigates market structure and efficiency as determinants of profitability in Turkish banking. The market power theory (the traditional structure-conduct-performance (SCP) and relative market power theories) and the efficiency theory are tested and distinguished for the Turkish banking industry for the years 1989-95 inclusive. The results of the study support the efficiency theory with there being no statistically significant evidence to support the market power theory for the period studied.

Duvan and Yurtoğlu (2004) argue that cyclical movements might have an effect on a bank's profitability via loan-loss provisions. This study investigates this argument along with the exploration of the determinants of banking provisions in the Turkish banking sector. In the Turkish case, it is found out that economic growth has a negative relationship with the loan-loss provisions. Provisions are also found to increase when TL/$ exchange rate rises. Another main conclusion of the study is that bank-specific factors have no effect on provisions.

Tunay and Silpar (2006a) use traditional statistical methods to examine the profitability performance of the Turkish banking sector. Bank-specific variables, macroeconomic variables and financial structure variables are used in the study. The model reflects the effects of both sectoral and macro

dynamics on profitability. There are two extensions of this study. First one is that commercial banks in Turkish banking system are classified according to their size and regression models of those groups are estimated. Secondly, the regression models of the commercial banks that are classified according to their ownership status by the Bank Association of Turkey (BAT) are estimated.

In this study, the determinants of the profitability of the banks grouped as large and small sized are found to be the ratio of loans to total assets, the ratio of non-interest income to total assets, the logarithm of total assets, inflation, real national income, the ratio of deposits to capitalization value of stock market, the ratio of capitalization value of stock market to national income and the ratio of total assets to national income. When the commercial banks are grouped as large, medium and small sized, they found consistent results with the two scale separation except from the ratio of capital to total assets and concentration ratio.

In Tunay and Silpar (2006b), the profitability performance of the two bank groups formed in Tunay and Silpar (2006a) is estimated using panel data techniques. In panel data analysis both fixed effects and random effects models are used. In this study, instead of linear regression, panel data technique is used for the banks grouped by ownership status, as well. Panel data regression results are found to be consistent with the least squares method regression results obtained in Tunay and Silpar (2006a). According to the results, bank-specific variables are highly related to the performance of banks. Besides, external variables are found to have an important effect on profitability performance as in the case of many developed and developing countries. They indicate that profitability performance of commercial banks in Turkey is sensitive to inflation and national income.

Günalp and Çelik (2006) employ the Panzar-Rosse H-statistic to assess the competitive environment of the Turkish banking industry over the period 1990

to 2000. The results indicate that for the period under consideration bank revenues behaved as if they were earned under conditions of monopolistic competition. The authors conclude that the observed high profitability of the Turkish banking sector does not seem to be an indication of an increase in monopoly power and the liberalization process and deregulation measures appear to have beneficial effects on competition.

Atasoy (2007) seeks to examine the effect of bank-specific, industry-related and macroeconomic variables on the profitability of the Turkish commercial banks over the period 1990-2005 by using panel data regressions. Before investigating the determinants of the Turkish banking industry profitability, the study evaluates the profitability performance of the Turkish banking sector by looking the profitability ratios in a time trend and comparing them with the countries of European Union as a benchmark.

The results show that the ratios of return on assets and return on equity are higher over the period of 1990-1998; however, they are below the inflation rates during this period. The study also indicates that the sector had huge amount of losses over the period of 1999-2001. The paper argues that during the period of 2002-2005, the returns decreased as compared to the period of 1990-1998; however, they are now much higher than the inflation rates, and it must also be stated that the income and cost structure converges to the banking industries of European Union members during these years. The study also shows that the return on assets, net interest margin, non-interest earnings, overhead ratios and loan loss provisions are higher than those of European Union countries. Using a balanced panel dataset of Turkish commercial banks over the period of 1990-2005, the estimation results indicate that return on assets tends to be associated with equity, non-interest earning assets, loan loss provisions, overhead, bank size, inflation, bank concentration ratio, importance of bank finance relative to gross national product and net interest margin tends to be associated with equity, non-interest earning assets, loan loss provisions, deposits, bank size, inflation,

growth, bank concentration ratio and importance of stock market finance relative to GNP.

Bektaş (2007) uses the panel data method to test for unit roots of profitability data and their persistency in the banking sector of an emerging country. According to the results of this study unit root hypothesis of data is rejected and concluded that in the long run persistency of profits does not exist.

Abbasoğlu, Aysan and Güneş (2007) examine the degree of concentration and degree of competition in the market by applying Panzar and Rosse's approach using the data from the detailed balance sheets of the banks that operated in the years from 2001 to 2005. They also explore the existence of relationship between efficiency and profitability of the banks taking into account the internationalization of banking. Their results do not suggest the existence of relationship between concentration and competition. They ran random effect regression with panel data of 135 observations to analyze the relationship between efficiency and profitability. According to the results, there is also no robust relationship between efficiency and profitability.

When we look at the econometric models used in literature, we see that panel data regressions, multiple regressions and two-step approach developed by Ho and Saunders (1981) are the most commonly used ones. In this study we aimed at identifying the determinants of net interest margin and profitability of Turkish banking system by using OLS regression technique as in the case of Kaya (2001). So, our study follows in the footsteps of this study. Table 1 illustrates the year, extent, dependent and independent variables of various empirical studies.

Table 1. Various Empirical Studies

Authors	Year	Extent	Dependent Variables	Independent Variables
Barajas, Steiner and Salazar	1999	National	NIM	Credit quality, Financial liberalization
Jiang, Tang, Law and Sze	2003	National	ROA	Loan loss expenses, Capital, Non-interest expenditures, Non-interest income, Tax rate, Inflation, Growth rate, Real interest
Hassan and Bashir	2004	International	ROA and ROE	Capital, Loans, Fixed assets, Growth rate, Bank size
Abreu and Mendes	2002	International	NIM, ROA and ROE	Capital, Unemployment, Inflation, Personnel expenditures, Loans, Market share
Saunders and Schumacher	2000	International	NIM	Net non-interest expenditures, Fixed assists, Capital, Interest volatility
Athanasoglou, Delis and Staikouras	2006	International	ROA	Loan loss expenses, Capital, Non-interest expenditures, Bank size, Foreign ownership, Concentration, Inflation
Naceur	2003	National	NIM and ROA	Capital, Non-interest expenditures, Loans, Inflation, Concentration, Stock market capitalization
Molyneux and Thornton	1992	International	ROA and ROE	Real interest, Concentration, Government ownership, Capital, Personnel expenditures, Liquidity
Demirgüç-Kunt and Huizinga	1999	International	NIM and ROA	Fixed assets, Loans, Deposits, Non-interest expenses, Foreign ownership, Real interest, Inflation, Growth rate, Required reserves, Tax rate, Deposit insurance, Total assets, Concentration, Stock market capitalization
Kaya	2002	Turkey	NIM, ROA and ROE	Capital, Liquidity, Personnel expenditures, Market share, Deposits, Net non-performing loans, Securities portfolio, Foreign exchange position
Tunay and Silpar	2006	Turkey	NIM, ROA and ROE	Non-interest expenditures, Capital, Loans, Non-interest income, Bank size, Inflation, Growth rate, Concentration, Sector size, Stock market capitalization

Table 1. (continued)

Atasoy	2007	Turkey	NIM and ROA	Deposits, Loans, Capital, Fixed assets, Provision for non-performing loans, Non-interest expenditure, Total assets, Inflation, Growth rate, Concentration, Sector size, Stock market capitalization

CHAPTER 3

TURKISH BANKING SYSTEM

In this chapter, having looked at the general structure of the financial sector, we will focus on the Turkish banking sector in the period 2005-2009:3.

3.1 Financial Sector View

The Turkish financial sector showed a stable course of growth in line with the favorable conditions of the Turkish economy through 2005, as was the case in 2004. Decreasing inflation, economic growth and positive expectations had an effect on the growth of the financial sector. Total asset size of the Turkish financial sector amounted to 469.9 billion Turkish Liras in 2005 and about 87 percent of total financial sector assets were composed of bank assets (CBRT, 2006). Despite the fluctuation period of May-June, the Turkish financial sector continued to demonstrate stable growth in 2006. The total asset size of the financial sector increased by 20 percent as of year-end 2006, compared to the previous year-end and reached 567 billion Turkish Liras. About 88 percent of total financial sector assets were composed of bank assets in 2006 (CBRT, 2007).

The Turkish financial sector maintained its stable growth trend in 2007. The total asset size of the financial sector, which grew by 18 percent compared to the previous year, reached TL 668 billion as of end-2007. 87 percent of financial sector assets belonged to banks (CBRT, 2008). In 2008, financial sector continued to grow as well. The total asset size of the financial sector increased by 24 percent as of year-end 2008, compared to the previous year-end and reached 828 billion Turkish Liras. (CBRT, 2008). 88,5 percent of total

financial sector assets are composed of bank assets in 2008 dominating the Turkish financial system (Figure 1).
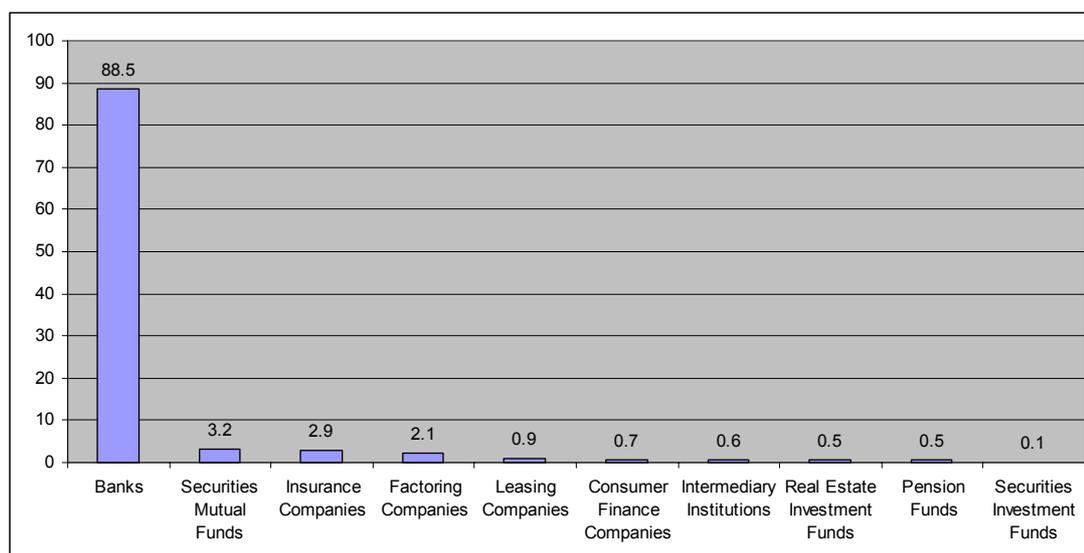
Figure 1. Composition of Balance Sheet of the Financial Sector (%)[2]

Source: CBRT, Financial Stability Report 2009.

3.2 Banking Sector

The Turkish banking sector consists of deposit banks, development and investment banks and participation banks that operate according to profit/loss sharing principles. Turkish economy had faced increasingly more frequent crises as from the 1990s and economic vulnerabilities increased due to the failure, for various reasons, to complete the stabilization programs initiated. During this period, basic structural problems such as the macroeconomic instability in the banking sector, distorting effect of state-owned banks, the small-scaled and fragmented structure of the sector and deficiencies in risk management have resulted in the deepening of exchange rate crisis experienced in February 2001 and its transformation into a systemic banking crisis. In order to establish a stronger structure for banks whose financial

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[2] As of December 2008.

standings and profitability performance deteriorated with the effect of the fluctuation in financial markets in November 2000 and the crisis in February 2001, the "Banking Sector Restructuring Program" was initiated in May 2001. The program aimed at restructuring state-owned banks, resolution of the banks transferred to the SDIF, rehabilitating the private banking system, strengthening the regulation and supervision framework, and increasing efficiency in the sector. In order to mention the restructuring program and progress, we benefited from Banking Sector Restructuring Program Progress Reports which were published by Banking Regulation and Supervision Agency.

Priority was given to the financial restructuring of state banks. It was completed and state banks began to make profits as of November 2002. Financial restructuring of the state banks concentrated on; liquidation of duty losses; elimination of short term liabilities; strengthening of capital base; determination of deposit rates in line with the market rates, and efficient management of loan portfolio. Simultaneously with the strengthening of their financial structure, operational restructuring studies were initialized.

Significant steps have been taken within the framework of operational restructuring. The main objective of the operational restructuring was to re-build organizational structure in compliance with the requirements of contemporary banking and international competition. Organizational, technological, product, human resources, loan, fiscal control, planning, risk management and service structures of the banks have been restructured in compliance with requirements of modern banking and international competition. Besides, number of branches of the state banks which was 2,494 as of December 2000 was brought down to 1.677 as of September 2002 and number of personnel which was 61.601 was brought down to 30,896. In order to strengthen the capital structure of state banks, funds in the form of both securities and cash were injected into these banks. Capital injections as well as the increased share of Treasury papers carrying zero

risk-weight contributed to the increase in capital adequacy. The state banks determined lending rates taking into account funding costs in order to achieve efficiency and profitability. In the aftermath of this restructuring, a positive impact in financial and operational restructuring began to show in the profitability performance of the state banks.

After the BRSA began operating on August 31, 2000, the administration of 13 banks was transferred to the SDIF, in addition to the 8 banks already under its administration. Of these 21 banks whose administration was taken over during the period 1997-2002, 13 banks were merged, 5 banks were sold to domestic and foreign investors and the license of 1 bank was revoked. After the merger of Pamukbank with Halkbank, by the end of December 2004 there was only 1 bank (Bayindirbank) left under the administration of the SDIF, which served as the bridge bank for the resolution of the SDIF banks. With the implementation of Decision No. 1085, dated July 3, 2003, of the Banking Regulation and Supervision Board, the license of Türkiye İmar Bankasi T.A.Ş. to perform banking activities and accept deposits was revoked and the management and control of this bank was transferred to the SDIF. The SDIF banks were subjected to an intensive financial and operational restructuring process following their takeover, including the following: short-term liabilities were liquidated; FX open positions were considerably reduced; deposit rates were decreased and brought in line with market rates; deposit and FX liabilities were transferred to other banks; and branch and personnel numbers were cut down to reasonable levels.

For the financial restructuring of banks that were taken over by the SDIF, a sum of $21.7 billion was required. Of this amount, $17 billion has been obtained from public sector resources and the remaining $4.7 billion from private sector resources (i.e., from the SDIF's own resources). With a view towards accelerating the resolution of the SDIF banks, their deposits and foreign exchange liabilities were transferred to other banks. Through a series of auctions backed by matching government securities portfolios an important

portion of the SDIF banks' deposits were sold to other banks. Auctions were realized within a separate bidding process for pools of TL and foreign exchange deposits in 5 stages. Open foreign exchange positions of the SDIF banks decreased substantially as a result of the injection of foreign exchange-indexed Treasury papers during the second half of May 2001.

Another important part of the Banking Sector Restructuring Program was strengthening private banks, whose financial structures and profitability performances were worsened due to the crises experienced. First steps were taken towards strengthening of the capital structures of private banks with their own resources and limiting the market risks within the scope of the program focused on private banks. Important progress has been realized on these areas. Private banks (excluding development and investment banks, and foreign banks' branches) strived to have a healthier structure and to reach internationally accepted minimum capital levels with the "Banking Sector Restructuring Program" implemented in May 2001.

Due to adverse economic and financial developments, the program was further strengthened by the introduction of a set of new instruments which strengthen the capital of private banks through public support if necessary, establish a legal framework for the restructuring of debts to the financial sector (known as the Istanbul Approach) and establish asset management companies. The legal framework for these instruments (Act No. 4743 on Restructuring of Debts to the Financial Sector and amendments made to some laws) were put into force on January 31, 2002. 25 privately owned deposit banks went through a three-stage audit and standard reports displaying the financial status of these banks as of December 31, 2001 were prepared. Provisional Article 4, added to the Banks Act, made it possible for those satisfying certain conditions to receive one time support in the form of the SDIF's participation in Tier 1 capital or a subordinated loan (Tier 2 capital). Besides, within the scope of restoring soundness in the private banking system mergers and acquisitions of banks and their subsidiaries

have been encouraged, while important improvements have also been realized in establishing internal control and risk management systems within the banking system.

In parallel to the financial and operational restructuring of banking sector, significant progress was achieved in legal and institutional regulations which strengthen the surveillance and supervisory framework, ensure competitiveness and efficiency and improve confidence to and endurance of the sector. Along these lines, regulations were issued to prevent risk concentration in loans, limit participation of banks to subsidiaries except non-bank financial institutions and ensure preparation and disclosure of banks' balance sheets in compliance with international accounting standards.

During and after the restructuring program, the banking sector has entered a high and stable growth period and the total assets of the sector which was TL 104 billion in 2000, grew by seven-fold in eight years and reached TL 733 billion. With the success of the program, the weight of public banks in the system has decreased. The capital structure of the sector has strengthened. The capital adequacy ratio which was 9.3 percent in 2000 rose to 18 percent as of end-2008. There has been a consolidation in the sector and concentration has increased after the restructuring program. The profitability performance of the sector and its asset quality has improved. In this context, while one fourth of loans were non-performing in 2001, the rate of non-performing loans fell below four percent in 2008. The financial intermediation has started to operate effectively, and the share of loans in the total assets of the sector rose to 50 percent in 2008, from 23 percent in 2001 (BRSA, SDIF, UoT, CBRT, 2009).

3.2.1 General Structure of Banking Sector

The declining trend in the number of banks started in the aftermath of 2000 also continued in 2005. The number of deposit banks and investment and development banks operating in Turkey decreased by 1 to 47 (Table 2). This

reduction resulted from the transfer of Ak Uluslararası Bankası AŞ to Akbank TAŞ. The most important development in the banking sector in 2005 was the increase in the direct or indirect investments by foreign investors in the sector. Within this framework, 50 percent of the shares of Türk Ekonomi Bankası AŞ were acquired by BNP Paribas, 89 percent of the shares of Türk Dış Ticaret Bankası AŞ were acquired by Fortisbank NV-SA, and 26 percent of the shares of T. Garanti Bankası AŞ were acquired by GE Capital Corporation (BAT, 2005).

Table 2. Number of Banks and Branches

	2005		2006		2007		2008	
	Bank	Branch	Bank	Branch	Bank	Branch	Bank	Branch
Deposit banks	34	6,228	33	6,804	33	7,570	32	8,741
State-owned banks	3	2,035	3	2,149	3	2,203	3	2,416
Privately-owned banks	17	3,799	14	3,582	11	3,625	11	4,290
Banks in the Fund	1	1	1	1	1	1	1	1
Foreign banks	13	393	15	1,072	18	1,741	17	2,034
Development and investment banks	13	19	13	45	13	48	13	49
State-owned banks	3	4	3	22	3	23	3	23
Privately-owned banks	8	13	6	11	6	12	6	12
Foreign banks	2	2	4	12	4	13	4	14
Total	47	6,247	46	6,849	46	7,618	45	8,790

* Including branches in the Turkish Republic of Northern Cyprus and branches abroad.

Source: BAT, Banks in Turkey 2006, 2007 and 2008.

The number of deposit banks and investment and development banks in Turkey was 46 as of the end of 2006. Total number of banks declined by 1 due to the merger of Koçbank AŞ and Yapı ve Kredi Bankası AŞ. Interest of foreign investors towards Turkish banking sector continued to be materialized in 2006. National Bank of Greece SA acquired 46 percent stake in Finans Bank AŞ and Dexia Participation Belgique SA acquired 75 percent stake in

Denizbank AŞ. Hence, these two banks switched category from the privately-owned commercial banks group into the group of foreign banks established in Turkey. Additionally, a stake of 58 percent in Bankpozitif Kredi ve Kalkınma Bankası AŞ was bought by Hapoalim BM Bank; a stake of 99 percent in Tat Yatırım Bankası AŞ was bought by Merrill Lynch European Asset Holdings Inc. Both of these banks also switched category from the privately owned development and investment banks group to the foreign development and investment banks group (BAT, 2006).

The number of deposit banks and investment and development banks in Turkey was 46 as of the end of 2007. Interest from foreign investors for the banking sector continued in 2007. 70 percent of Tekfen Bank AŞ's shares were sold to Arab Bank PLC and Bankmed, and all shares of Oyak Bank AŞ were sold to ING Bank NV. Hence, category of these three banks changed from the private banks to foreign banks established in Turkey (BAT, 2007).

The number of banks operating in Turkey was 49 as of year-end 2008. Out of these, 4 were participation banks. The number of deposit banks and development and investment banks decreased by 1 to 45 in 2008 compared with the end of 2007. With its Decision No. 2893 and dated 13 November 2008, BRSA decided to terminate the activities of Istanbul Branch of Unicredit Banca di Roma S.p.A. and authorized its voluntary liquidation. (BAT, 2008). As of the first quarter of 2009, there were 32 deposit banks and 13 development and investment banks. 3 of deposit banks were state-owned and 11 of them were privately owned banks. There was 1 bank under SDIF. Also, the upward trend in the number of bank branches in Turkey continued in the period 2005-2008 as seen in Table 2.

As a result of the increasing interest of foreign investors in the Turkish banking sector in 2006, the share of foreigners that was 12.4 as of December 2005, reached 22.4 percent of the total assets of the banking sector as of year-end 2006, including those banks whose share transfer process was

finalized in April 2007 (Figure 2). On the other hand, according to data of the Central Registry Agency, the share of the foreigners in publicly held shares was 16.4 percent with respect to total assets of the sector for the same period. When these shares were added, the share of foreigners becomes 38.8 percent (CBRT, 2007). As seen in Figure 2, the share of foreigners continued to increase in both 2007 and 2008 and became 25.3 as of March 2009. On the other hand, when the shares of foreigners in publicly held shares were added, the share of foreigners reaches to 41.3 percent in Turkish banking sector.
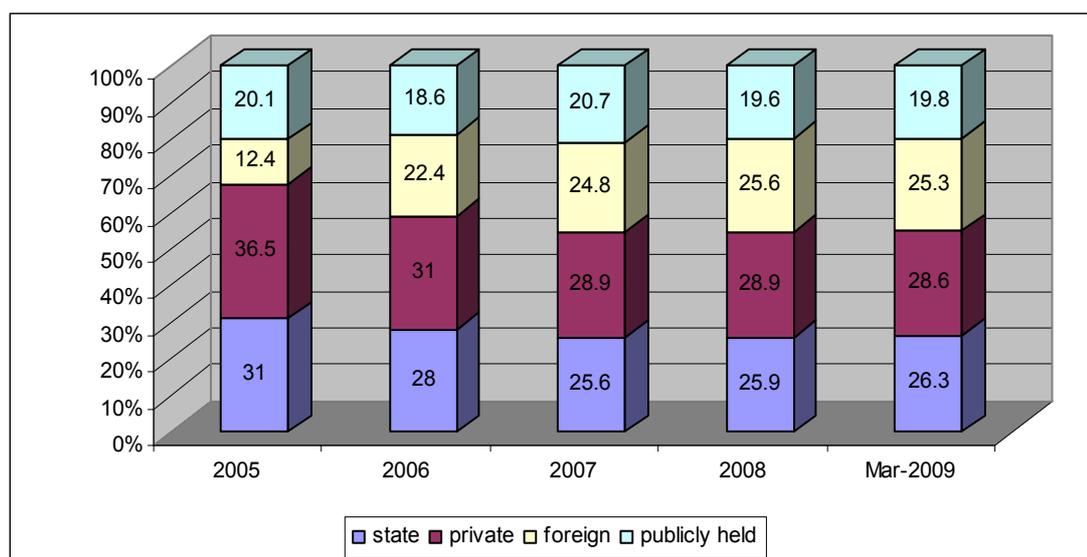
Figure 2. Banking Sector Assets According to Equity Ownership (%)[3]

Source: CBRT, Financial Stability Report-2009

3.2.2 Asset - Liability Structure

As seen in Figure 3 below, the share of securities portfolio in total assets was 35 percent as of the end of 2005. There was a declining trend in the share of securities portfolio through 2006-2008 period but it increased by 2 points

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[3] For publicly held shares no distinction is made between domestic and foreign investors.

compared to the December 2008 and became 28 percent as of the end of the first quarter of 2009. Due to the positive developments in macroeconomic indicators and positive expectations of the markets, the share of loan portfolio in total assets became 39 percent and the loan portfolio became the largest asset item in 2005. It continued to increase in the period 2006-2008 but it decreased by 1 point compared to the end of year 2008 and became 49 percent as of the end of 2009:3. The share of other assets (including fixed assets) in total assets shows a declining trend in the period 2005-2009:3.
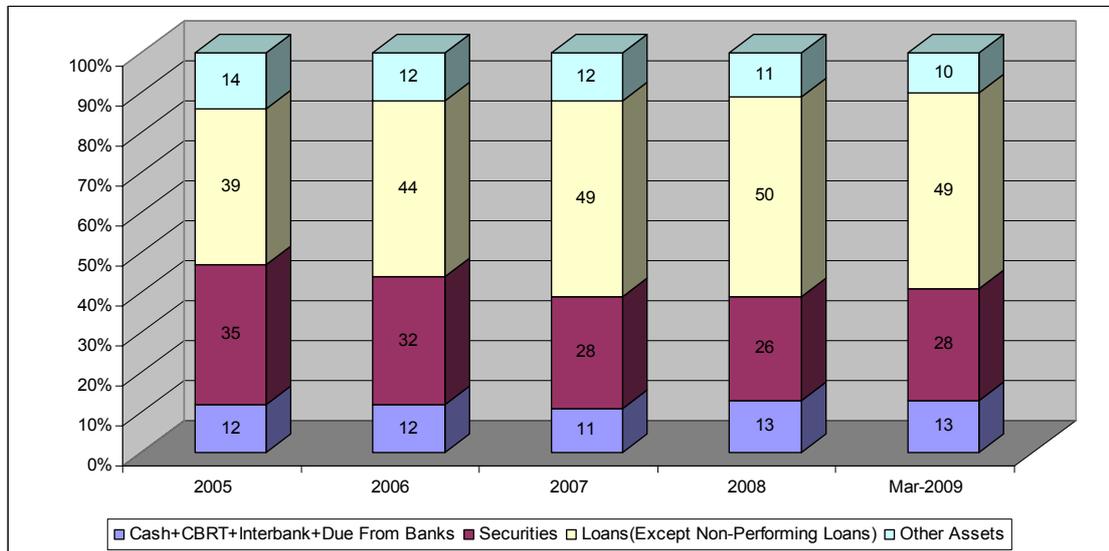
Figure 3. Asset Structure of the Banking Sector

Source: CBRT, Financial Stability Report 2009

When we examine the liability structure of the banking sector in Turkey, we see that the share of deposits as the largest source of funds remained the same with 62 percent in the period 2005-2009:3. The shares of shareholders' equity, and due to banks, which followed a rather volatile course, were both 12 percent as of the end of 2009:3 (Figure 4).
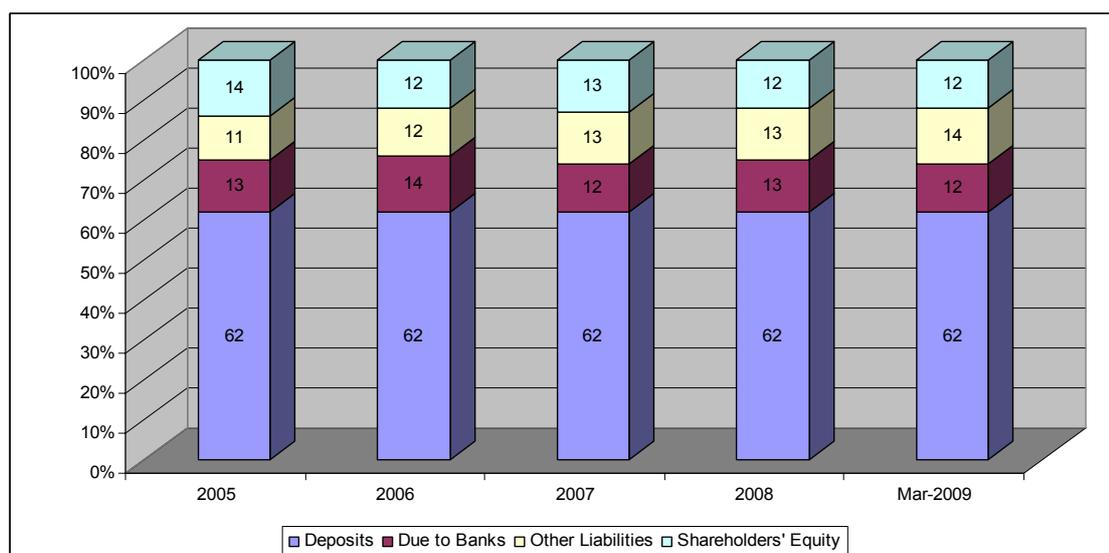
Figure 4. Liability Structure of the Banking Sector

Source: CBRT, Financial Stability Report 2009.

On the other hand, we think that government domestic debt instruments held by banks are one of the important determinants of profitability in Turkey. Due to the government debt securities given to banks during the restructuring process following the crises, they have been the biggest component of the securities portfolio. Banks in Turkey traditionally place significant amount of their funds to government securities since they bear almost no risk.

Table 3. Distribution of Government Domestic Debt Instruments by Investors (TL million)

	2005	2006	2007	2008
Non-financial residents	65,252	66,063	67,636	73,767
Real persons	28,274	24,091	16,523	16,395
Corporates	36,978	41,972	51,112	57,372
Mutual funds	21,584	9,590	12,657	14,198
Persons resident abroad	27,332	36,767	36,981	29,936

Table 3. (continued)

Non-financial residents (Total)	114,168	112,420	117,274	117,901
Banks and other	132,429	143,331	150,128	156,926
Total	246,597	255,751	267,402	274,827

Source: BAT, Banks in Turkey 2007 and 2008.

As of December 2005, 54 percent of government securities were held by banks. Total government securities held by non-bank sectors were TL 114,168 million; 25 percent of this amount (TL 28 billion) was held by real persons. Government securities held by non-bank sectors constituted 27 percent of the outstanding domestic debt stock in 2005. Preferences of individual investors for savings instruments changed in favor of deposits due to the higher level of interest rates on deposits (Table 3).

As seen in Table 3, banks held 56 percent of overall government domestic debt instruments in 2007. As of December 2008, the share of government domestic debt securities held by banks increased by 1 point and became 57 percent. Total government domestic debt instruments held by non-bank sector became TL 118 billion. 14 percent of this sum (TL 16.4 billion) was demanded by real persons. Government domestic debt instruments held by non-bank sectors constituted 43 percent of total outstanding debt in 2008. Demand of the non-residents for government domestic securities decreased in 2008 while that of the legal persons increased. (Table 3). When we examine the distribution of government debt securities according to the ownership status of the banks, it is seen that there is an increasing trend in foreign banks but the share of them is still small compared to the state owned and privately owned banks during the period 2005-2009:3 (Table 4).

Table 4. Distribution of Government Domestic Debt Instruments by Ownership Status (%)

	2005	2006	2007	2008	2009:3
State-Owned banks	57	56	45	47	47
Privately owned banks	41	41	47	44	44
Foreign banks	2	3	8	9	9
Total	100	100	100	100	100

Source: BRSA, Interactive Monthly Bulletin.

After the restructuring program, there has been a consolidation in the sector and concentration has increased. As of December 2005, the shares of the largest five banks in total assets, total deposits and total loans were 63 percent, 66 percent and 56 percent, respectively. The same shares were 85 percent, 89 percent and 80 percent, respectively for the largest ten banks (Table 5). In terms of total asset size, there were two state owned and 3 privately owned banks among the largest five banks as of December 2005. There were 3 state owned and 7 privately owned banks in the largest ten banks in Turkey in the same period (BAT, 2005).

Concentration decreased in 2007 generally and as of December 2008, the share of the largest five banks in total assets remained at 62 percent while the share of the largest ten banks increased by 1 point to 86 percent (Table 5). In terms of total asset size, there were 1 state owned bank and 4 privately owned banks among the largest five banks of the banking sector as of December 2008. There were 3 state owned, 4 privately owned and 3 foreign banks in the largest ten banks in Turkey in the same period (BAT, 2008).

Table 5. Concentration in Banking System (%)

	2005	2006	2007	2008
Largest five*				
T.assets	63	63	62	62
T.deposits	66	64	64	65
T.loans	56	58	57	58
Largest ten*				
T.assets	85	86	85	86
T.deposits	89	90	89	90
T.loans	80	83	83	84

*In terms of total assets.

Source: BAT, Banks in Turkey 2007 and 2008.

Most of the evidence on bank structure and performance is devoted to the US banking industry, providing generally conflicting results. Some evidence indicates that banks in highly concentrated local markets charge higher rates on loans, pay lower rates on deposits, and are slower to reduce rates in response to Federal Reserve decrease in interest rates than banks in less concentrated markets. Alternatively, Smirlock (1985) finds that interest rate spreads are narrower in concentrated banking industry, while Keeley and Zimmerman (1985) find more mixed evidence. Berger (1995) concludes that the relationship between bank concentration and performance in the US depend critically on what other factors are held constant. We could not test the concentration variable in this study because of the lack of the monthly data. However, the evidence in Turkey is given by Atasoy (2007). According to the study, concentration is negatively related to return on equity and net interest margin in Turkey.

On the other hand, the banks in Turkey preferred to lend money through lower risk instruments like Treasury Bills due to high real interest returns with low risk premiums. However the interest rates have started to decline after 2001 crisis and the banks have channeled their operations towards the consumer credit markets. The high interest rate spread together with low

default rates provides substantial profit opportunities for the issuers in the Turkish credit card market. This situation is one of the reasons for the increasing appetite of the international banks to acquire the Turkish banks in recent years (Aysan and Muslim, 2006). Any examination of worldwide credit practices shows that Turkish banks apply higher credit card interest rates than those in other countries. Chakravorti (2003) categorizes the consumers under two groups according to their usage of credit cards. He discusses that the convenience users pay the credit card bill on due date and the revolvers use the credit feature of the cards. The convenience users are not as profitable as the revolvers for the issuers given that they just use the credit cards as the payment instruments. Hence, the interest free grace period of the convenience users were also financed by the revolvers. According to Aysan and Muslim (2006), extremely high interest rates in Turkish credit card market are likely to stem from these consumer characteristics.

3.2.3 Income - Expense Analysis and Profitability

As seen in Table 6, the net profit of the banking sector was realized as 10.6 billion Turkish Liras as of year-end 2006, increasing by 94 percent on an annual basis. The fact that one bank, which incurred a high amount of net loss by year-end 2005, made a profit in 2006, was also effective in the increase in the profit and improved profitability performance of the banking sector.

Table 6. Net Profit and Its Components (Million TL)*

	2006	2007	03.2008	2008	03.2009
I. Operating Income (A+B)	31,707	38,586	10,886	43,030	14,198
A. Net Interest Income	20,376	25,007	7,297	29,635	9,503
B. Non-Interest Income	11,331	13,579	3,589	13,395	4,695
II. Non-Interest Expenses (C+D)	18,484	22,248	6,704	28,355	8,439

Table 6. (continued)

C. Prov. For Credits and Other Receiv.	4,068	5,467	2,179	8,172	3,562
D. Other Operating Expenses	14,416	16,782	4,525	20,183	4,877
III. Net Operating Profit (I-II)	13,223	16,338	4,182	14,675	5,750
IV. Other Income	429	1,093	522	1,041	388
V. Provision for Taxes	3,070	3,203	931	3,022	1,151
VI. Net Profit (III+IV-V)	10,582	14,227	3,774	12,695	4,996

*Non-interest income = Net Fees and Commissions Income (Including Banking Services Income) + Dividend Income + Net Trading Income (Loss) + Other Operating Income
Other Income = Profit Share Received Excluding Dividend Income + Extraordinary Income (Expenses)

Source: CBRT, Financial Stability Report 2007, 2008 and 2009.

As of year-end 2006, the decrease in the provisions for loans and other receivables and the increase in the operating income are the determinants of the rise in the profit of the banking sector. Besides the increase in net interest income, the 17.9 percentage increase in net fees and commissions income as a component of non-interest income, contributed to the increase in operating income. On the other hand, the ratio of operating income to operating expenses increased to 219.9 percent in 2006. The increase in net fees and commissions income and the ratio of operating income to operating expenses is evaluated positively in terms of profitability (CBRT, 2006). Despite fluctuations in the global markets and high losses of the world's major banks, profitability of the Turkish banking sector improved in 2007. The net profit of the sector increased by 34.4 percent at end-2007 compared to end-2006, and reached TL 14.2 billion (Table 6).

The upsurge in profitability of the banking sector was triggered by net interest income that increased due to interest income on loans, along with the rise in non-interest income, particularly net fees and commissions income. The significant increase in other income item mainly stems from extraordinary

income (CBRT, 2007). When compared to the previous period, high profitability in December 2007 was obtained largely from the fact that interests from loans and interests from securities portfolio (SP) grew more rapidly in comparison to previous year. Despite the decrease in interests from securities available for sale and securities held to maturity compared to the previous year, especially interests from securities available for sale was the most important component of interest incomes because of its high share within SP (BRSA, 2007). In addition, although total non-interest incomes increased moderately, total non-interest expenses increased more rapidly, causing a net non-interest expense. However, in parallel with this development, as financial markets became normal back again, foreign exchange losses item increased depending on the fluctuation in financial markets in 2006 transformed into profit in 2007 and hence, profitability of the sector was affected positively (BRSA, 2007).

Due to the the negative repercussions of the global crisis on our country observed in the last quarter of 2008, the net profit of the sector declined by 10.8 percent, compared to the end of the previous year and stood at TL 12.7 billion as of year-end 2008. At end-2008, despite the 11.5 percent rise in operating income due to the increase in net interest income and net fees and commissions income, the 27.4 percent rise in non-interest expenses resulted in a decline in the profitability of the banking sector (Table 6). The decline in non-interest income was due to the fact that income from the sale of assets in this period was not realized as high as the previous year and foreign currency gains turned into losses.

In the last quarter of 2008, non-interest expenses increased because of the 84.1 percent rise in special provisions for non-performing loans, which increased significantly due to the negative repercussions of the global crisis on our country and slowdown in economic activity, and the upsurge in operating expenses, particularly personnel expenses and other non-interest

expenses. The increase in non-performing loans and its adverse impact on profitability are expected to continue in 2009. (CBRT, 2009).

Turkish Accounting Standards Board made amendments in order to allow reclassification of "financial assets at fair value through profit or loss" and "financial assets available for sale", to be effective as of 1 July 2008. The aim of the amendment was to limit the adverse effects of financial fluctuations on profitability. However, although the interest rates on government domestic debt securities increased significantly since September 2008, they dropped in parallel with the decrease in CBRT policy rates after November 2008. Therefore, the advantage of the reclassification resulting from the rise in rates ended during the period the interest rates declined (CBRT, 2009).

The net profit of the sector, which had been on the fall as of year end-2008, increased by 32.4 percent in the first quarter of 2009 compared to the same period of the previous year, and stood at TL 5 billion (Table 6). The increase in the profitability of the banking sector in the first quarter of 2009 was mainly due to the rise in operating income and the most important factor behind the increase in operating income was the net interest income. The ratio of net interest income to average interest- earning assets, which stood at 5 percent at end-2008, increased to 5.8 percent in this period. Since the rate of decline in interest rate of loans lagged behind that of deposits due to the decline in CBRT policy rates, funding cost was declined and the ratio of net interest income to average interest- earning assets increased rapidly. Moreover, non-interest income increased due to the fact that net trading losses turned into gains. The increase in net trading income was resulted from the increase in profits from the transactions in securities and the decrease in foreign currency losses. The 63.5 percent rise in provisions for credits and other receivables was the another important development special to this period The negative impact of the upward trend in non-performing loans on the profitability of the sector is expected to continue during the rest of 2009 (CBRT, 2009).

As of December 2006, rapid growth in the net profit of the period had positive effect on banks' profit ratios as net return on assets rose to 2.3 percent from 1.4 percent and return on equity rose to 19.1 percent from 10.6 percent. Return on equity was above the annual average interest rate of the government domestic securities for the first time in the near past. In 2007, the banking sector's net return on assets rose to 2.6 percent from 2.3 percent, while return on equity increased to 19.5 percent from 19.1 percent. Return on assets dropped in foreign banks and development and investment banks while increased in state-owned banks and private banks. As of December 2008, the banking sector's net return on assets decreased to 1.8 percent from 2.6 percent and return on equity decreased to 15.4 percent from 19.5 percent. Due to the negative repercussions of the global crisis on our country, return on assets and return on equity dropped in all bank groups in 2008 (Table 7). However, the profitability performance began to increase in 2009 parallel to the increase in net income.

Table 7. ROA and ROE

	2005		2006		2007		2008	
	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE
Deposit banks	1.3	10.6	2.2	20.5	2.5	20.9	1.7	16.4
State-owned banks*	2.3	21.6	2.8	26.3	2.8	26.8	1.9	22.5
Private banks	0.6	4.7	1.8	17.0	2.4	19.9	1.8	15.8
SDIF banks	14.0	16.9	-	-	12.4	15.7	9.6	12.2
Foreign banks	2.5	15.5	2.6	21.7	2.0	15.2	1.3	10.5
Dev. and inv. banks	5.3	10.9	4.8	9.7	4.6	9.6	4.0	8.7
Total	1.4	10.6	2.3	19.1	2.6	19.5	1.8	15.4

*SDIF bank is included in 2006.

Source: Banks in Turkey 2005, 2006, 2007 and 2008

CHAPTER 4

EMPRICAL FRAMEWORK

4.1 Data and Variable Definition

In this section we will introduce the data and variables used in the empirical work. Sectoral and macroeconomic profitability determinants are the two sets of variables used in this study.

4.1.1 Data

In this thesis, for the sectoral variables we will use monthly balance sheet and income statement data from Interactive Monthly Bulletin published by Banking Regulation and Supervision Agency. For the inflation and industrial production index data, website of Turkstat is used. The sectoral variables are formed by the aggregated data of commercial banks in Turkey (33 banks) given in Table 8 over the period 2005-2009:3.

Table 8. Banks in Data Set

Türkiye Cumhuriyeti Ziraat Bankası A.Ş.
Türkiye Halk Bankası A.Ş.
Türkiye Vakıflar Bankası T.A.O.
Adabank A.Ş.
Akbank T.A.Ş.
Alternatif Bank A.Ş.
Anadolubank A.Ş.
Şekerbank T.A.Ş.
Tekstil Bankası A.Ş.
Turkish Bank A.Ş.
Türk Ekonomi Bankası A.Ş.
Türkiye Garanti Bankası A.Ş.
Türkiye İş Bankası A.Ş.
Yapı ve Kredi Bankası A.Ş.

Table 8. (continued)

Birleşik Fon Bankası A.Ş.
Arap Türk Bankası A.Ş.
Citibank A.Ş.
Denizbank A.Ş.
Deutsche Bank A.Ş.
Eurobank Tekfen A.Ş.
Finans Bank A.Ş.
Fortis Bank A.Ş.
HSBC Bank A.Ş.
Millennium Bank A.Ş.
ING Bank A.Ş.
Turkland Bank A.Ş.
ABN AMRO Bank N.V.
Bank Mellat
Habib Bank Limited
JPMorgan Chase Bank N.A.
Société Générale (SA)
Unicredit Banca di Roma S.p.A.*
WestLB AG

*Included up to December 2008.

4.1.2 Variable Definition and Expectations

The three performance measures used in this study are return on assets (ROA), return on equity (ROE) and net interest margin (NIM). Although these three measures of profitability performance reflects the same reality, it will be appropriate to use all of them in the study since they have some advantages and disadvantages compared to each other (Tunay and Silpar, 2006a) All of these, either singularly or in combination, have been used in previous studies that we mention in chapter 2. Profit margin and spread are the other profit measures used in literature.

One of the performance measures used in this study is ROA. It is the ratio of net income to total assets and it measures the profit earned per lira of assets and reflect how well bank management use the bank's real investment resources to generate profits.

Another performance measure used in this study is ROE. It is the ratio of net income to equities and it indicates the return to shareholders on their equity and equals ROA times the total assets-to-equity ratio. The latter is often referred to as the bank's equity multiplier, which measures financial leverage. According to Athanasoglou et al. (2006), banks that have lower leverage (higher equity) generally report higher ROA, but lower ROE. They argue that ROA is the key ratio for the evaluation of bank profitability since ROE disregards the risks associated with high leverage and financial leverage is often determined by regulation.

The third performance measure used in this study is NIM. NIMs can be measured using ex ante and ex post spreads. The ex post spread is the actual difference between banks actual interest revenue and banks actual interest expenses. Ex ante spread is the difference between the contractual rate charged on loans and rates paid on credit (Huizinga et al., 1999). The authors highlight the superiority of ex post over ex ante spread. A major advantage being that ex post spreads account for loan defaults and risky credits by taking into account the actual interest paid and interest received whereas ex ante spreads do not account for these making ex post more suited to the present analysis. So, in this study, the NIM variable is defined as the net interest income divided by total assets where the net interest income is calculated as the difference between the interest income and interest expense. NIM is focused on the profit earned on interest activities. According to Kaya (2001), despite its deepening progress, diversification in operation, use of new technology and human resources capacity, Turkish banking sector works with high interest margins. She discusses that high interest margins are also one of the main factors behind high bank profitability in Turkey and thus policymakers should improve the policies that make possible to have efficiency and profitability simultaneously in Turkish banking sector.

In this study, we use six bank characteristics as internal determinants of profitability performance. They comprise the ratio of non-interest expenses to total assets (NIE), the ratio of non- interest income to total assets (NII), the ratio of equity capital to total assets (CAP), the ratio of deposits to total assets (DEP), the ratio of fixed assets to total assets (FIX), and the ratio of securities portfolio to total assets (SP) (Table 9).

Table 9. Definition of Variables

Variable name	Definition
ROA	Net income / total assets
ROE	Net income / equity
NIM	Net interest income / total assets
NIE	Non-interest expenses / total assets
NII	Non-interest income / total assets
CAP	Equity capital / total assets
DEP	Deposits / total assets
FIX	Fixed assets / total assets
SP	Securities portfolio / total assets
INF	Inflation (Rate of Change in Twelve Months Moving Averages (%))
IPI	Industrial Production Index

Fixed assets are composed of net non-performing loans, net affiliates, subsidiaries and joint ventures, net assets to be sold and net premises and equipment. Net securities held for trading, net securities available for sale and net securities held to maturity form the securities portfolio. CAP, FIX, DEP and SP data all belong to the balance sheet. Non-interest expenses data consists of personnel expenses, provision for termination indemnities, fees and commissions paid, depreciation, taxes, duties, charges and funds and other non-interest expenses data in income statement. Non-interest income data is the total non-interest income in income statement of banks as well.

Non-interest expenses are expected to have a negative impact on performance since efficient banks are expected to operate at lower costs. As we know, banks are intermediaries between lenders and borrowers. Secondly, we expect that the higher the equity capital, the lower the need for external funding and therefore higher profitability. It is also a sign that well-capitalized banks face lower costs of going bankrupt and therefore their cost of funding is reduced (Naceur, 2003, p.6) It is expected that the banks whose funding depends more on deposits are less profitable since it requires more branches and more operating expense but with deposits the profitability may be affected positively in long term. Since government debt securities constitute the huge amount of securities portfolio of the Turkish banking sector and the cost of it is relatively small, we expect that securities portfolio impact positively on profits while increasing share of the fixed assets in balance sheet is expected to have a negative impact.

The two macro-economic variables used in this study are inflation (INF) and industrial production index (IPI) (Table 9). Previous studies have reported a positive relationship between inflation and bank profitability. High inflation rates are generally associated with high loan interest rates, and therefore, high incomes. However, Revell (1979) discusses that effect of inflation depends on whether banks' wages and other operating expenses increase at a faster rate than inflation. The question is that how mature an economy is so

that future inflation can be accurately forecasted and thus banks can accordingly manage their operating costs. As such, the relationship between the inflation rate and the profitability is ambiguous and depends on whether or not inflation is anticipated. Perry (1992) states that an inflation rate fully anticipated by the banks' management implies that banks can appropriately adjust interest rates in order to increase their revenues faster than their costs and thus acquire higher profits. On the contrary, unanticipated inflation could lead to improper adjustment of interest rates and hence to the possibility that costs could increase faster than revenues and hence adversely affect bank profitability. Besides, industry production index is expected to have a positive impact on banks' performance.

A broad description of the characteristics of the variables used in the study is given in Table 10 which reports their statistical means and standard deviation.

Table 10. Descriptive statistics

Variable name	Maximum	Minimum	Mean	Std. Dev.
ROA	0.038829	0.013101	0.024315	0.004698
ROE	0.266113	0.105979	0.207465	0.036236
NIM	0.059976	0.041305	0.047449	0.004702
NIE	0.050139	0.030061	0.034530	0.003584
NII	0.042934	0.023744	0.028468	0.003552
CAP	0.146092	0.100495	0.117440	0.010734
DEP	0.652647	0.618089	0.636990	0.006844
FIX	0.078523	0.031398	0.045836	0.013886

Table 10. (continued)

SP	0.425156	0.278440	0.341992	0.045502
INF	15.03000	4.090000	9.146275	3.101623
IPI	127.1000	83.60000	108.1725	11.11388

4.2 Model Specification

The empirical test is concerned with the determinants of interest margin and profitability of the Turkish commercial banks over the period 2005:2009:3. There are various approaches in terms of econometric modeling of banking profitability performance in the literature. In this aspect, Tunay and Silpar (2006a) mention two different approaches basically. The first one can be summarized as testing the simple models which depends on the separation of the components of the profitability and performance measures only. The study of Jiang, Tang, Law and Sze (2003) is a typical example of this approach. The second and more complex approach depends on the analysis of the performance measures including both the internal and external determinants. In terms of econometric modeling of banking profitability performance, we used the combination of the two approaches that we mention above. The aim is combining the superior parts of the two approaches in order to make an easier and dynamic analysis.

In this respect, the three performance measures are separated into both internal and external factors and estimated in a multiple regression model formed in a similar structure. The first order autoregressive, or AR (1), model is the simplest and most widely used model of serial correlation. The AR (1) model is used in this study and it is specified as follows:

$$Y_t = X_t{'}\beta + u_t$$

$$u_t = \rho u_{t-1} + \varepsilon_t$$

where ρ is the first order serial correlation coefficient. In effect, the AR (1) model incorporates the residual from the past observation into the regression model for the current observation. To estimate an AR(1) model in EViews, it is suggested that one enters the specification as usual and add the special expression "AR (1)" to the end of the list of independent variables. In order to see the details of estimating AR (1) model in EViews, see EViews 5 User's Guide.

4.3 Empirical Results

This section provides empirical evidence on the determinants of bank profitability and interest margins in the Turkish banking industry. It is important to check whether a series is stationary or not before using it in a regression. The formal method to test the stationarity of a series is the unit root test. A series is said to be (weakly or covariance) stationary if the mean and autocovariances of the series do not depend on time. It is possible that one can confront the problem of spurious regression when worked with the non-stationary time series (Granger and Newbold, 1974). The regression result does not reflect the actual relation in this case. However, Gujarati (2006) states that regression analysis with non-stationary series may reflect the actual relation if those series are cointegrated. In this study, stationarity analysis is realized by "Augmented Dickey-Fuller" (ADF) unit root test developed by Dickey and Fuller (1981). ADF unit root test is represented as follows:

$$\Delta Y_t = \beta_1 + \beta_2 t + \Delta Y_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta Y_{t-i} + \varepsilon_t$$

where Δ represents the first difference operator and ε_t is the white noise error term. In order to remove serial correlation in the residuals in above

equation, sufficient number of lags of the variable should be included. In this study, the lags of the dependent variable used to obtain white-noise residuals are determined by using Schwartz Criterion (SC). The series used in this study are found to be stationary (Table 11).

Table 11. ADF Unit Root Test Results

	Intercept	Trend and intercept	None
ROA	-3.835735*** (-3.568308)	-3.772386** (-3.502373)	-0.969795
ROE	-2.645819* (-2.598551)	-3.239935* (-3.180699)	-0.327228
NIM	-2.977078** (-2.921175)	-2.408206	-0.690729
NIE	-3.206052** (-2.921175)	-4.606382*** (-4.152511)	--1.110724
NII	-4.688054** (-3.568308)	-4.745291*** (-4.152511)	-0.367642
CAP	-2.828203* (-2.598551)	-3.005993	-1.252199
DEP	-5.409301*** (-3.568308)	-5.413571*** (-4.152511)	0.285164
FIX	-4.123808*** (-3.574446)	-1.720654	-4.077602*** (-2.612033)
SP	-2.159841	-1.923814	-2.618670*** (-2.612033)
INF	-5.855118*** (-3.577723)	-5.882373*** (-4.165756)	-0.537964

***,** and * implies significance at the %1, %5 and %10 levels, respectively. Numbers in parenthesis show the critical values.

Since DEP, SP and IPI variables are found to be insignificant in ROA, ROE and NIM equations; we excluded them and estimated the models again. The regression results are given in Tables 12, 13 and 14. Also, stability and specification tests are conducted to ROA, ROE and NIM equations. According to the Breusch-Godfrey Serial Correlation LM Test and Ramsey Reset Test given in tables below, there is no serial correlation and specification problem in ROA, ROE and NIM equations. Also, the result of White Heteroskedasticity Test verifies that there is no heteroskedasticity problem in ROA and NIM equations. However, we report White's heteroskedasticity-consistent standard errors in ROE equation.

Table 12. Determinants of Turkish Commercial Banks' ROA

Dependent Variable: ROA Method: Least Squares Sample (adjusted): 2005M02 2009M03 Included observations: 50 after adjustments Convergence achieved after 11 iterations				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.033608	0.007742	-4.341241	0.0001
NIE	-0.752447	0.177901	-4.229589	0.0001
NII	0.838735	0.124188	6.753768	0.0000
CAP	0.570675	0.078214	7.296338	0.0000
FIX	-0.283894	0.068556	-4.141031	0.0002
INF	0.000620	0.000213	2.910622	0.0057
AR(1)	0.573309	0.116478	4.922054	0.0000
R-squared	0.828687	Mean dependent var		0.024025
Adjusted R-squared	0.804783	S.D. dependent var		0.004259
S.E. of regression	0.001882	Akaike info criterion		-9.584122
Sum squared resid	0.000152	Schwarz criterion		-9.316439
Log likelihood	246.6030	F-statistic		34.66702
Durbin-Watson stat	1.861429	Prob(F-statistic)		0.000000
Inverted AR Roots	.57			
Lagrange Multiplier (2)	0.264826			
White Heteroskedasticity	1.749940			
Ramsey RESET Test	0.021701			

Table 13. Determinants of Turkish Commercial Banks' ROE

Dependent Variable: ROE
Method: Least Squares
Sample (adjusted): 2005M02 2009M03
Included observations: 50 after adjustments
Convergence achieved after 11 iterations
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.083475	0.057269	-1.457586	0.1522
NIE	-6.522041	1.666480	-3.913662	0.0003
NII	7.132659	1.189323	5.997245	0.0000
CAP	3.152907	0.618230	5.099895	0.0000
FIX	-2.338241	0.650367	-3.595267	0.0008
INF	0.005234	0.001971	2.655993	0.0110
AR(1)	0.588939	0.122160	4.821045	0.0000
R-squared	0.820804	Mean dependent var		0.206292
Adjusted R-squared	0.795800	S.D. dependent var		0.035613
S.E. of regression	0.016093	Akaike info criterion		-5.291714
Sum squared resid	0.011136	Schwarz criterion		-5.024031
Log likelihood	139.2929	F-statistic		32.82682
Durbin-Watson stat	1.859270	Prob(F-statistic)		0.000000
Inverted AR Roots	.59			
Lagrange Multiplier (2)	0.333060			
White Heteroskedasticity	1.819904			
Ramsey RESET Test	0.009743			

Table 14. Determinants of Turkish Commercial Banks' NIM

Dependent Variable: NIM
Method: Least Squares
Sample (adjusted): 2005M02 2009M03
Included observations: 50 after adjustments
Convergence achieved after 9 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009991	0.009315	1.072503	0.2895
NIE	-0.043101	0.223375	-0.192955	0.8479
NII	0.186447	0.154638	1.205701	0.2345
CAP	0.229164	0.095325	2.404043	0.0206
FIX	0.001355	0.090058	0.015042	0.9881

Table 14. (continued)

INF	0.000734	0.000275	2.669044	0.0107
AR(1)	0.622147	0.133991	4.643202	0.0000
R-squared	0.771499	Mean dependent var		0.047199
Adjusted R-squared	0.739615	S.D. dependent var		0.004392
S.E. of regression	0.002241	Akaike info criterion		-9.234368
Sum squared resid	0.000216	Schwarz criterion		-8.966684
Log likelihood	237.8592	F-statistic		24.19717
Durbin-Watson stat	1.821186	Prob(F-statistic)		0.000000
Inverted AR Roots	.62			
Lagrange Multiplier (2)	0.587492			
White Heteroskedasticity	0.423348			
Ramsey RESET Test	0.243169			

In ROA and ROE equations, non-interest expenses, non-interest income, equity capital, fixed assets and inflation; in NIM equation, equity capital and inflation are found to be significant.

Empirical results of this study show that there is a negative and significant coefficient on the non-interest expenses to assets ratio variable (NIE) in the ROA and ROE equations while the coefficient of non-interest expenses is found to be insignificant in NIM equation. The negative relationship between NIE and profitability implies a lack of competence in expenses management, since banks pass part of increased cost to customers and the remaining part to profits, possibly due to the fact that competition does not allow them to "overcharge". Clearly, efficient cost management is a prerequisite for the improved profitability of the Turkish banking system. Other empirical studies have revealed similar results. For example; Demirgüç-Kunt and Huizinga (1999), Kaya (2002), Jiang, Tang, Law and Sze (2003) and Athanasoglou, Delis and Staikouras (2006) reported that operational expenses and ROA are negatively related.

The most effective variable on ROA and ROE is found to be the NII variable as seen in tables 12 and 13. Regression results of this study show that non-

interest income variable (NII) has a positive effect on ROA and ROE. So, for a long-term, persistent profitability; a high level of the non-interest income is vital for Turkish banks. Because of this, when the interest rates decreased, banks sought to decrease the operational expenses and increase non-interest income via the variation of product and services in Turkey.

According to our empirical results, there is a positive relationship between equity variable (CAP) and profitability performance. Findings of Molyneux and Thornton (1992), Berger (1995), Demirgüç-Kunt and Huizinga (1999), Saunders and Schumacher (2000), Hassan and Bashir (2000), Abreu and Mendes (2002), Naceur (2003), Athanasoglou, Delis and Staikouras (2006) are the examples of studies that achieved positive relationship between equity and profitability in various countries. We confirm the positive relationship whether we use return on assets, return on equity or net interest margin as dependent variable. This may indicate that well-capitalized banks support lower expected bankruptcy costs and thus lower funding costs and higher interest margins on assets. Generally, this advantage translates into better profitability ratios. On the other hand, Guru et al. (2000) and Kaya (2002) claims that capital and ROE is negatively related since a higher capital ratio tends to reduce the risk on equity and therefore lowers the return on equity.

Parallel to Atasoy (2007), our findings reveal the negative and significant relationship between fixed assets and ROA. Although the coefficient of fixed assets in NIM equation is insignificant, our results also reveal the negative relationship between fixed assets and ROE. Since fixed assets consist of non-interest bearing assets, increase in the share of fixed assets in balance sheet leads to decrease in interest income and it will have a negative impact on profitability performance of the banks. In this regard, recent increase in the free shareholders' equity[4] in Turkish banking system supports our result. Different from our results, Atasoy (2007) and Demirgüç-Kunt and Huizinga

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[4] Shareholders' equity is defined by shareholders' equity minus fixed assets.

(1999) reported the negative relationship between non-interest bearing assets and NIM.

Among the macroeconomic variables, inflation is found to be positively related to profitability according to our empirical results. This implies that, with inflation, bank income increases more than bank costs, which may be viewed as the result of the failure of bank customers (comparative to bank managers) to forecast future inflation. Our results are parallel to Demirgüç-Kunt and Huizinga (1999), Kaya (2002) and Abreu and Mendes (2002) that reported positive relationships between inflation and NIM and ROA. Also, there is a positive relationship between inflation and ROA according to the findings of Jiang, Tang, Law and Sze (2003), and Athanasoglou, Delis and Staikouras (2006).

CHAPTER 5

CONCLUSIONS

When the studies that aimed at the determinants of profitability performance of the banks are examined, it is seen that panel data regressions, multiple regressions and two-step approach developed by Ho and Saunders (1981) are the mostly used models in the literature. The main variables used in these models are bank specific variables that are under the control of bank management and macroeconomic and financial structure variables that are not controlled by bank management. Liquidity level, provision policy, capital adequacy, expense management and bank size are the examples of bank specific variables. Inflation, growth rate and real interest rate are the examples of macroeconomic variables and concentration and stock market capitalization are the examples of financial structure variables.

In this thesis, before passing to the econometric study aimed at the determinants of profitability performance of Turkish banking system, the general structure of the system, asset-liability structure, and profitability are analyzed for the period 2005-2009:3. First of all, when the banking sector assets according to equity ownership are examined, increasing share of foreigners attracts attention. There is a declining trend in the share of securities portfolio whereas the share of loans in total assets increased in the period 2005-2009:3. On the other hand, when we examine the liability structure of the banking sector in Turkey, we see that the share of deposits was the largest source of funds in the mentioned period.

Having looked at the asset-liability structure of the sector, we analyzed the net profit and its components in detail. As of year-end 2006, the increase in the operating income and the decrease in the provisions for loans and other receivables are the determinants of the rise in the profit of the banking sector. The upsurge in profitability of the banking sector in 2007 was triggered by net

interest income that increased due to interest income on loans, along with the rise in net fees and commissions income as one of the non-interest income components. Since the rise in non-interest expenses exceeded the rise in operating income due to the increase in net interest income and net fees and commissions income, profitability of the banking sector decreased at end-2008. The net profit of the sector, which had been on the fall as of year end-2008, increased in the first quarter of 2009 compared to the same period of the previous year. The increase in the profitability of the banking sector in the first quarter of 2009 was mainly due to the rise in operating income. The most important factor behind the increase in operating income was the net interest income. Also, non-interest income increased due to the fact that net trading losses turned into gains as of March 2009. Another important development special to this period was the rise in provisions for credits and other receivables. The negative impact of the upward trend in non-performing loans on the profitability of the sector is expected to continue during the rest of 2009.

When we look at the profitability ratios, we see that there is an increase in return on assets and return on equity in the period 2005-2007. Due to the negative repercussions of the global crisis on our country in the last quarter of 2008, there is a decrease in both ratios in 2008. However, the profitability performance of the Turkish banking sector improved parallel to the increase in net income as of March 2009.

After analyzing the asset-liability structure and profitability of the Turkish banking system in a time trend, we empirically investigated the determinants of profitability in commercial banks over the period 2005-2009:3. Within the micro determinants; non-interest expenses, non-interest income, equity capital, fixed assets and inflation are found to have significant effects on return on assets (ROA) and return on equity (ROE). The findings of this study also revealed that, the most important contributors of the net interest margin (NIM) are equity capital and inflation.

Among the bank characteristics, our results show that non-interest expenses have a negative relationship with bank profitability in Turkey implying a lack of competence in expenses management. Similarly, Demirgüç-Kunt and Huizinga (1999), Kaya (2002), Jiang, Tang, Law and Sze (2003) and Athanasoglou, Delis and Staikouras (2006) reported that operational expenses and ROA are negatively related. Also, non-interest income is found to have a positive impact on ROA and ROE suggesting that for a long-term, persistent profitability; a high level of the non-interest income is extremely important for Turkish banks.

Consistent with Molyneux and Thornton (1992), Berger (1995), Demirgüç-Kunt and Huizinga (1999), Saunders and Schumacher (2000), Hassan and Bashir (2000), Abreu and Mendes (2002), Naceur (2003) and Athanasoglou, Delis and Staikouras (2006), our empirical results reveal that there is a positive relationship between equity variable and profitability and net interest margin. This may indicate that well-capitalized banks support lower expected bankruptcy costs for themselves and their customers, which reduce their cost of capital.

Empirical results of this study also reveal the negative significant relationship between fixed assets and ROA parallel to Atasoy (2007). Although the coefficient of fixed assets in NIM equation is insignificant, our results also reveal the negative relationship between fixed assets and ROE. Since fixed assets consist of non-interest bearing assets, increase in the share of fixed assets in balance sheet leads to decrease in interest income and hence the profitability of the banks. So, Turkish banks should decrease the share of fixed assets in their balance sheet in order to achieve high profitability.

Among the macroeconomic variables, inflation is found to have a positive relationship with profitability parallel to the findings of Demirgüç-Kunt and Huizinga (1999), Kaya (2002), Abreu and Mendes (2002), Jiang, Tang, Law and Sze (2003), and Athanasoglou, Delis and Staikouras (2006). This implies

that with inflation, bank income increases more than bank costs, which may be viewed as the result of the failure of bank customers (comparative to bank managers) to forecast future inflation. On the other hand, securities portfolio, deposits and industrial production index are found to be insignificant in determining the profitability of Turkish commercial banks.

As a matter of policy implications, we need to draw several proposals for the Turkish banking sector. Our empirical results suggest that for the permanence of profitability, there should be a strong capital structure in the sector. The improvement of the profitability of Turkish commercial banks need to be conducted by a reinforcement of the competence in expenses management, by increasing the non-interest income via the variation of product and services and by reducing the proportion of fixed assets to the benefit of bank loans. Lastly, since the empirical results suggest a negative relationship between inflation and profitability, traditional intermediation services of the banks should be emphasized in the low inflation environment in Turkey.

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