

Macroeconomic, Sector Specific and Bank Specific Determinants of Net Interest Rate Margin: What Matters More For An Emerging Market Economy?

Abstract

The period after 2001 in Turkey is marked with the high economic growth, bettering macroeconomic conditions and strengthening financial sector. Turkish banks have shown remarkable performance in this period, and ironically increased their profits even during the recent global financial crisis. In this paper, we analyze the determinants of net interest margin as proxy for the cost of financial intermediation. The paper covers the commercial banks for the period from the last quarter of 2001 to the first quarter of 2009. The fixed effect panel data regressions show that inflation, interbank interest rates and real growth among the macro economic variables; sector concentration among the banking sector variables; risk aversion and implicit interest payments among the bank specific variables are significant in explaining the net interest margin. Recovery and stabilization period and global crisis dummies are significant as well. The results indicate the precedence of the general macroeconomic conditions and the market structure of the sector over the bank specific variables. Our results also reveal the importance of deterioration in the risk perceptions in increasing the net interest rate margin during the global financial crisis.

Key words: Banking Sector, Turkish Economy, Net Interest Margin, Global Financial Crisis

JEL codes: G1, G2

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Macroeconomic, Sector Specific and Bank Specific Determinants of Net Interest Rate

Margin: What Matters More For An Emerging Market Economy?

1.Introduction

The announcement of financial statements in the first quarter of 2009 triggered a discussion on the profitability of the banking sector in Turkey. During the global financial crisis, the international financial giants declared substantial amounts of losses and some had gone bankruptcy. On the contrary, their counterparts in Turkey have realized sizeable profits. Ironically the subsidiaries of international banks in Turkey made profits, while their managers in home countries were struggling with the toxic assets and expropriation processes. This case could be interpreted as a success story of Turkish banking sector characterized with the risk averse attitudes of bank managements and tougher financial regulations after the 2001 banking crisis of Turkey. The capital adequacy ratio of Turkish banking sector and the amount of non-performing loans do not constitute a threat for the stability of the sector.¹ One the other side, the high profitability of banking sector could be attached to the uncompetitive market structure enabling banks to conduct monopolistic behaviors such as setting high prices on intermediary activities during the economic turmoil.

The banks were blamed for shrinking credit lines while general economic activity was slowing down. Their response to the Turkish Central Bank's policy of cutting interest rates was criticized based on the argument that the banks were lowering the interest rates on deposits but not on credits. The lower interest margin as a characteristic of competitive financial structure is generally associated with greater social welfare thanks to lower cost of intermediary activities. The rationale of the critics relies on the increasing cost of

¹ The capital adequacy ratio and total non-performing loan to asset ratio are 18 and 3.57 respectively as the end of 2008 (BDDK, 2008).

intermediary activities as an indicator of inefficient market. In that sense, the analysis of net interest margin (NIM)² in Turkey has gained importance to shed light on the current debate.

In this study, NIM in the Turkish banking sector between 2001 and 2009 is investigated from the competition and efficiency interpretation of the margin. This period is particularly chosen because of its distinguishing features. The performance and function of the Turkish banking sector in 1990s were highly affected by the general economic conditions described by high inflation and high public sector borrowing requirements (PSBR). In the end of 2000, the snapshot of the sector reveals the dominance of public banks with huge duty losses, connected lending practices, unhealthy asset structure dominated by the government bonds, severe exposure to market risk and poor corporate governance (Akin et al. 2009). After 2000 and 2001 crisis, two main facets- strong regulatory agencies working on international standards and increasing share of credits in asset portfolio as a result of diminishing PSBR- made the post-crisis era rather different from 1990s.

The period from 2001 crisis to the global financial crisis is generally depicted as a favorable era due to the global and domestic conditions. Low inflation, political and macroeconomic stability as well as fiscal discipline and decreasing PSBR are the components of the favorable domestic circumstances. In the global context, global economy experienced fascinating growth episode while the global liquidity was providing more lenient fund transfers to the developing countries. Akin et al. (2009) divided this period into two sub-periods for the banking sector. The 2001-2005 period, called recovery and stabilization period, is associated with the strong regulatory agencies and consolidation. The period after 2005, named as the growth period, has the characteristics of high profitability and the rapid asset growth in the sector. Besides, favorable global conditions provided the Turkish banks better access for the

² The net interest margin is defined as a spread between a bank's interest revenues and expenses as a percent of total asset.

syndication and securitization loans. Foreign entry to the market has dramatically increased especially after Turkey and EU started membership negotiations in 2005. This study attempts to uncover how the cost of intermediary activities proxied by the net interest rate margin has changed during the reshaping of the financial sector. In other words, we investigate the determinants of NIM in Turkey for the post-crisis era.

This study employs the fixed effect panel data regressions where the effects of explanatory variables are regressed on NIM. The data set covers the period from the last quarter of 2001 to the first quarter of 2009. The variables are categorized under three headings: macroeconomic variables, bank specific variables and market specific variables. Among these variables, we found macroeconomic variables as the most important group that explains the change in NIM. Inflation, growth and interbank interest rate are found statistically significant in the regression results. As the inflation and interbank interest rates go up, the margin widens in Turkey. Hence, macroeconomic stability aiming to keep inflation at single digit numbers and to enhance confidence in the market by reducing the interbank interest rates must take first precedence on the agenda of policy makers.

Similar to the macroeconomic variables, the Herfindahl-Hirschman Index (HHI) as an indicator of competition is found significant in all models. As HHI decreases, in other words market becomes more competitive; NIM diminishes as well. In the set of bank specific variables, the risk aversion calculated as the ratio of total equity to total asset and implicit interest payment as an indicator of non-interest expense, emerge as statistically significant determinants of NIM. While equity ratio increases as a sign of risk aversion, NIM also increases. Similarly, there is also positive relationship between the operational expenses and NIM. Other bank specific variables do not appear to be statistically significant. This finding indicates the limits of banks' management in determining the price through implementing certain strategies when the macroeconomic and sector specific variables are controlled. The

study highlights that as long as the macroeconomics variables outweigh the effects of other variables, the bank specific strategies do not have much power in affecting NIM. In that sense, in order to attain more efficient and competitive financial markets, the regulators and government as having the ultimate responsibility for the performance of the overall economy need to be vigilant in ensuring macroeconomic stability .

The findings of the study shed light on the current debate of high intermediation cost of banks in Turkey to a certain extent. In spite of the increasing competition in recent years, the Turkish banking sector is still characterized with a low level of competition (Abbasoglu et al. 2007). Hence, the further improvements in the market structure of the banking sector are expected to reduce NIM. There are also other factors that explain the surge in NIM in the last quarters. Our findings indicate the positive relationship between interbank interest rates and NIM. Together with this finding, a positive relationship between risk aversion and NIM also signals the importance of confidence in the market. While the banks perceive uncertainty more in the general economic conditions, the price of their products and their NIM rise. Hence, the jump in NIM in the Turkish banking sector after the demise of Lehman Brothers can be explained by increasing uncertainty about the prospect of financial markets.

Similar to other Central Banks, Turkish Central Bank has also cut the interest rates to stimulate the economy during the global crisis. However, the banks acted slowly to reduce their lending rates. This sequence of events led to a sudden rise in NIM. Moreover, most of the deposit holders have contracts lasting less than three months, while the credits granted by the banks have one year maturity in average. This structure enabled the banks to offer lower interest rate on the new deposit contracts without changing the interest rates on the lending contracts issued before the crisis. Eventually, this mechanism has also amplified NIM. However, since our findings emphasize the predominance of the macroeconomic variables, NIM is expected to decline while macroeconomic indicators improve.

Although there are many studies on the competition, profitability and efficiency of the Turkish banking sector³, there are very few papers on the determinants of NIM. Türker-Kaya (2002) examines the NIM for the 1997-2000 period. The study found that the equity, liquid assets, amount of deposit and personnel expenses have a significantly negative effect on the margin. On the other hand, the margin is positively affected by the inflation, public sector borrowing requirements and the share of bank's asset in the sector. However, this study only examines pre-crisis period. There appears to be no paper on NIM covering the post-crisis period in Turkey. Certainly, the Turkish banking sector experienced a rapid transformation after the crisis. Hence, the determinants of NIM for the post-crisis era need to be explained with a more recent data set. Our study attempts to fill this gap by employing the fixed effect regressions on a panel of commercial banks.

The study is structured as follows. Next section describes the movement of net interest margin in Turkey. The third section explains the empirical specifications, the sample used and the variables. Section 4 presents the empirical results. Section 5 summarizes main conclusions of the study and proposes the policy recommendations.

2. Evolution of the Net Interest Margin in Turkey

NIM is generally defined as the spread between interest rate on credits and interest rate on deposits. The margin is broad indicator of price levels that banks offer to their customers. The determination of a single price for the financial products is not possible since the banks provide various types of services with different prices. The broader concept like net interest rate margin calculated from the balance sheet items is frequently used to identify price level in the market. The most common NIM measure is the net interest revenue as a percentage of total assets (Ho and Saunders, 1981; Maudos and Guavera, 2004; Demirguc-Kunt and Huizinga, 1999). This definition covers the interest rate revenues from all the interest earning

³ For example, see Aysan and Ceyhan (2008-a) and Aysan and Ceyhan (2008-c).

activities like credits, bonds, interbank loans in addition to the aggregate interest rate expenses like deposits and credits from other financial institutions and markets.

The evolution of NIM for the commercial banks is depicted in Figure 1⁴. The margin has reached its peak in 2001 crisis when the public sector borrowing requirement was at the maximum level and the banks were reluctant to give credits to the private sector. Moreover, the banks were exposed to severe credit risk owing to the economic crisis. At end of the 2004, NIM is not considerably lower than its level in 2002. However NIM has smoothly declined after 2004. This decline is associated with the reduction in the cost of non-deposit funds like syndication and interbank loans for the Turkish banks during the recovery period. Particularly after 2004, the promising macroeconomic performance of Turkey with low real interest and inflation rates and the initiation of EU negotiations made the syndication and securitization credits less costly for the Turkish banks. Moreover, NIM has also declined because of the entry of foreign banks especially after 2005⁵. However, the decreasing trend of NIM was not permanent and the margin started to increase with the first signs of the global financial crisis. NIM is calculated separately for the private, state and foreign banks in order to observe different patterns among them (Figure 2). Foreign banks have always higher NIM as compared to the state and private banks during the whole period. This difference mainly stems from their distinct funding strategies. Relatively less number of branches of foreign banks limits their ability to collect deposits. However, they have an advantage to reach the interbank loans and international credits thanks to their international reputations. The gap in NIM between foreign and other banks has declined as a result of the improvement in the

⁴ The margins are calculated from the balance sheets of commercial banks published by the Turkish Banking Association.

⁵ For the detailed analysis of the foreign bank entry into Turkey, see Aysan and Ceyhan (2007); Aysan and Ceyhan (2008-b).

ability of the Turkish banks to use syndication and securitization credits. Another critical development is the narrowing gap between the state and private banks. Although the margins of state banks exceeded the margins of the private banks up to 2003; the difference disappeared in recent years.

Comparing the NIMs before and after 2001 crisis, the average NIM during the period between 1992 and 1998 was 5.9 (Türker-Kaya, 2001). On the other side, the average in the period 2002-2008 was 4.7. This decrease is attributed to the favorable global and domestic macroeconomic conditions. The motivation behind this study is to analyze the main determinants of NIM for the post-crisis period. Hence, we utilized the fixed effect estimations to capture the determinants of NIM for the post-crisis episode.

3. Empirical Model

In the fixed effects specifications, the dependent variable is NIM measured as the ratio of Net Interest Revenue to Total Assets. The quarterly data ranges from the 2001-4th quarter to 2009-1st quarter. Twenty four commercial banks are included in the estimations. Independent variables are grouped into three headings: macroeconomic variables, banking sector variables and bank specific variables. Summary statistics for the variables are given in Table I. Correlation matrix is also provided in Table II. The macroeconomic variables are taken from the Central Bank of Republic of Turkey whereas the banking sector and bank specific variables are obtained from the Turkish Banking Association.

The model is tested for serial correlation using Wooldridge test for autocorrelation in panel data. F value for the test is 8.902. We reject the null hypothesis that there is no serial correlation. Hence, we employ regression with AR(1) disturbances. Our model is then stated as follows:

$$NIM_{it} = c_i + \beta_1 X_{it} + \beta_2 Y_{it} + \beta_3 Z_{it} + u_{it} + \alpha u_{it-1}$$

Where: NIM_{it} is the net interest margin of bank i in period t ; X_{it} is the vector of macroeconomic variables in period t ; Y_{it} is the vector of bank specific variables for bank i in period t ; Z_{it} is the vector of banking sector variables in period t ; u_{it} is the residual for bank i in period t .

3.1. Macroeconomic Variables

Inflation: Inflation is associated with the uncertainty and high nominal interest rates. In times of increasing uncertainty, firms postpone their investments and the high nominal interest rates discourage households and firms to take loans. Moreover, a surge in the inflation increases the yields of the government bonds. Hence, the banks prefer to hold safe government bonds with high yields while charging higher interests for the consumer and corporate loans. Hence, we expect inflation to have a positive relationship with NIM.

GDP Growth: High GDP growth indicates a rising demand for both consumption and investment. Hence, during the economic booms, the households and firms demand more loans. In a financially less developed country like Turkey, increasing demand for loans during the economic growth periods increases the NIM due to the limited availability of capital. Hence, we expect GDP growth to have a positive coefficient.

Interbank Interest Rates: Fluctuations in the interbank interest rates indicate the confidence among the banks to each other and to the aggregate economy. Interbank interest rates are also affected by the policy rate of the Central Bank. At lower rates, the cost of capital is lower; thereby, banks tend to charge with a lower margin. Conversely, higher rates imply more uncertainty and the banks tend to charge with higher margins. Hence the interbank interest rate is expected to have a positive coefficient in explaining NIM.

Real Interest Rates: Real Interest Rate is the real cost of capital for the banks. Hence, an increase in the real interest rates induces banks to give higher interest rates for the deposits but even higher interest rates are charged for the credits due to increasing uncertainty. Thus,

we expect real interest rates to have positive correlation with NIM. 12-month backward ex-post rates are used to capture the real interest rate. Since the interbank interest rates and real interest rates represent the similar determinants of the NIM, in the benchmark model, the interbank interest rate is used while the real interest rates are relegated to the robustness part.

3.2. Banking Sector Variables

Sector Concentration: When the banking sector is highly concentrated, banks have monopolistic powers to keep the NIM higher. Hence, we expect a positive relationship between concentration and NIM. The measure generally used for the concentration is the Herfindahl-Hirschman Index (HHI). This index has an advantage of giving higher weights to the bigger firms as compare to other concentration indices. However, concentration indices including HHI fail to capture the effects of product differentiation or geographic advantages⁶ which enable some banks to exercise monopolistic power beyond their market share. However, we follow the existing literature in characterizing the market structure. For example, Ho and Saunders (1981) and Maudos and Guavera (2004) use similar variables to capture the market structure.

Share of Banking Sector: This variable is the ratio of the total assets of the banking sector over GDP which shows the depth of the banking sector in Turkey. This ratio in Turkey is still well below the OECD average. However, as the financial deepening improves, the banking sector in Turkey is expected to become more competitive as NIM declines. Hence, we expect a negative correlation between the share of banking sector and NIM.

3.3. Bank Specific Variables

Bank Size: Big banks have certain degree of monopolistic power to keep NIM higher than small banks. On the other hand, big banks have the potential to benefit from the economies of

⁶ For example, some banks in Turkey have branches even in very small towns and thereby exercising their monopoly powers in such places.

scale and to increase credit size while reducing their NIM. Total asset of a bank is used as a proxy for the bank size. Many papers in the literature use this variable in measuring the bank size (Afanasieff et al. 2001; Maudos and Guevera, 2004).

Credit Size: When the banks apply a policy of increasing credits, they tend to increase deposit rates in order to obtain more funds and decrease credit rates to increase credit amount. In both cases, NIM decreases. Hence, we expect NIM and the credit size to have a negative correlation especially in Turkey given that the main source of loanable funds still comes from the deposits. The credit size is measured by the total credits over total assets.

Market Share: Banks with higher market share are able to exercise more monopoly power to increase credit rates and decrease deposit rates as compared to the banks with lesser share. Thus, we expect market share to have positive correlation with NIM. Market share is measured as the ratio of bank's total assets over total assets in the banking sector.

Liquidity Ratio: Liquidity ratio is measured as the liquid assets over total assets. Banks with more liquid assets are more likely to have less net interest revenue since liquid assets are more prone to yield lower returns. Liquidity is put into the estimations by Drakos (2003) and Elian and Valentine (2005).

Size of Off-Balance Sheet Accounts: Off-balance sheet accounts include the fee generating activities (letter of credit, letter of guarantee etc.), trading revenues and returns from derivative assets. As the banks diversify their revenue sources through off-balance sheet accounts, they become more eager to decrease their margin. Thus, the negative relationship is expected.

Risk Aversion: Equity over total assets (which is converse of leverage) is used as an indicator of risk aversion. Risk averse banks are likely to charge higher interest rates for loans. Therefore, we expect positive relation between risk aversion and NIM. For example, during the financial turmoil in 2008-2009, the banks become even more risk averse while increasing

their NIM. Degree of risk aversion is introduced by Ho and Saunders (1981) to the literature. Maudos and Guevera (2004) use the same proxy while Drakos (2003) prefers to use the converse of risk aversion which is leverage.

Implicit Interest Payments: Implicit Interest Payments variable is similar to the other operating expenses. However, implicit interest payments variable is more comprehensive while considering other operational income (or loss). Ho and Saunders (1981), Saunders and Schumacher (2000), Maudos and Guevera (2004) use the implicit interest payments in their estimations. The variable is calculated as the non-interest expense over total asset. As implicit interest payments increase, the cost of operations becomes more expensive. Hence we expect positive relation between the implicit interest payment and NIM.

Credits Taken: Credits taken by the bank from other sources affect NIM as well. The loans, notably loans from international markets or banks, often bear much lower interest rates. Hence, the decline in the interest expenses of the banks due to loans from other sources leads to an increase in NIM. However, this process also aggravates the foreign exchange risk exposure of the banks which in turn increases NIM. The empirical results will reveal which effect eventually dominates.

Ratio of Bad Debt: Total non-performing loans over total loans are used as the ratio of bad debt variable. While this ratio increases, the quality of banks asset deteriorates. The banks often increase their interest rate on credits to cover this cost. Hence, we expect positive relation between the ratio of bad debt and NIM.

3.4. Other Variables

Recovery and Stabilization Period Dummy: Aftermath of 2001 crisis, the Turkish banking sector has gone through a series of reforms to reconstruct the financial sector. Akın et al. (2009) calls the period between 2001 and 2005 as the recovery and the stabilization period while the period after 2005 is named as the growth period. We expect that in the recovery and

the stabilization period, NIM is relatively higher to allow the banks to heal their balance sheets after the crisis. On the other hand, in the growth period, we observe more rapid growth of asset size of the sector as the foreign banks enter into the Turkish market (Aysan and Ceyhan 2008-b). Dummy variable takes value of 1 between 2001 and 2005 and 0 otherwise.

Global Crisis Dummy: It is clearly seen in Figure 1 that net interest margin increased after the last quarter of 2008. Crisis dummy takes value of 1 in the first quarter of the 2009 and 0 otherwise. Global crisis has worsened the risk perception in the markets and the banks in turn contracted the amount of loans given. Deterioration in the risk perceptions is associated with increase in NIM in the literature (Maudos and Guevera, 2004; Saunders and Schumacher, 2000). Hence, it is expected that the global crisis dummy has a positive coefficient in explaining NIM.

4. Empirical Results

The results of our benchmark model are given in Table III. Inflation, interbank interest rates and real growth among the macro economic variables; sector concentration among the banking sector variables; risk aversion and implicit interest payments among the bank specific variables are found significant. Recovery and Stabilization Period and Global Crisis dummies are significant as well.

Inflation and interbank interest rates are found positively related to NIM showing that the monetary authorities have power to influence NIM. By keeping inflation low, the authorities could affect NIM downwards. Unlike other papers (Demirguc-Kunt and Huizinga, 1999; Maudas and Guevera, 2004), we have found that NIM is positively related to the real economic growth. This result is quite reasonable for the developing countries like Turkey considering their less developed financial markets. Certainly, for these capital scarce countries, the demand for capital rises as the economy grows. However, since the competition is limited, banks charge higher rates for the credits while increasing NIM.

Sector concentration is also found positively related to NIM. This is in line with our prior expectations. As the concentration in the banking sector increases, monopoly powers of the banks increase and they provide higher interest rates for credits and lower interest rates for deposits. This result also shows that as the financial sector in Turkey deepens, banking sector will be more competitive and NIM will decline.

Among the bank specific variables, risk aversion and implicit interest payments are found positively related to NIM. Higher leverage or lower equity is associated with higher risk. However, in Turkey, the regulatory authorities are quite cautious to let the banks to undertake too much risk (Al and Aysan, 2006). Hence, the banks in Turkey operate with very high capital adequacy ratios. However, this result shows that this strategy comes with a cost of rising NIM. Implicit interest payments include the expenses of a bank that are not directly related to the banking operations. Thus, if a bank manages its expenses more efficiently, it can afford to have lower NIM.

It is also found that NIM is relatively lower in the Recovery and Stabilization Period. However, the global financial crisis has increased NIM in line with our expectations. Deterioration in the risk perceptions of the banks led to an immediate jump in their lending rates and a decline in their deposit rates following the interest rates cuts by the Central Bank.

In the Appendix, the robustness of our model is also tested by considering some additional variables. Our results are robust to the inclusion of the total assets and credit taken among the bank specific variables. They both significantly lead to an increase in NIM. We also add the real interest rate variable to our set of macroeconomic variables in the benchmark model. The results confirm the positive relationship between real interest rate and NIM

5. Conclusion

The empirical results point out the predominant role of macroeconomic environment in determining NIM. All the macroeconomic variables turn out to be significant. However,

among the sector specific variables, only the concentration index is significant at 5 percent level. Similarly, among the bank specific variables, only risk aversion and implicit interest expense are found significant. Based on the limited effects of the bank specific variables, the results indicate the precedence of the general macroeconomic conditions of the country and the market structure of the sector. Our results also reveal the importance of deterioration in the risk perceptions in increasing NIM during the global financial turbulence.

The positive effect of implicit interest expense on NIM indicates the validity of the efficiency related arguments. As the banks cut their expenses by introducing new technologies such as internet banking, ATM; NIM declines along with the costs.

In Turkey, there is a deliberate policy by the authorities to limit leverage after the severe financial crisis of 2001. The banking sector in Turkey operates with high capital adequacy ratios. Our results also show that higher equity ratios lead to higher NIM. In this regard, the prudent strategies of the regulators are not costless. This risk averse strategy has kept Turkish banks strong during the financial turmoil. However, the public pays the cost of this policy by bearing higher NIM.

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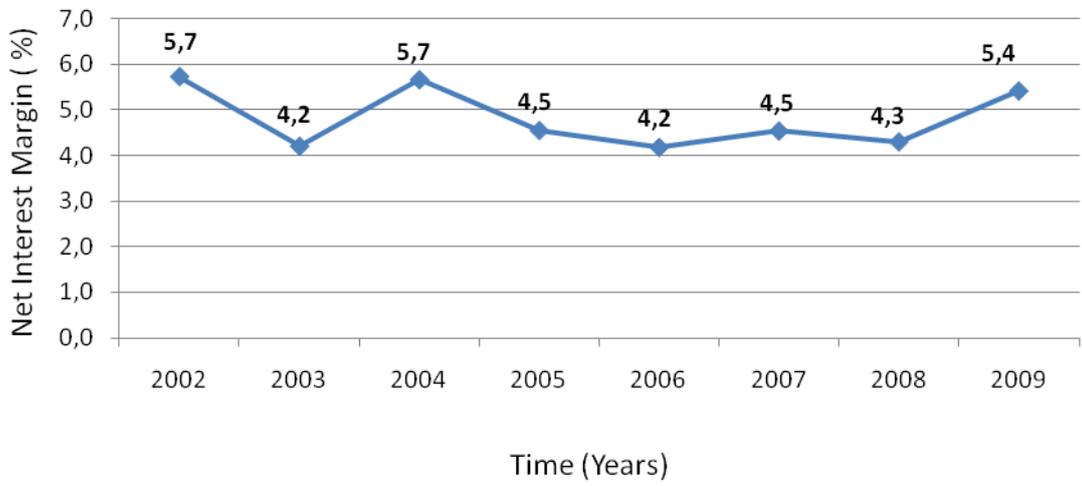
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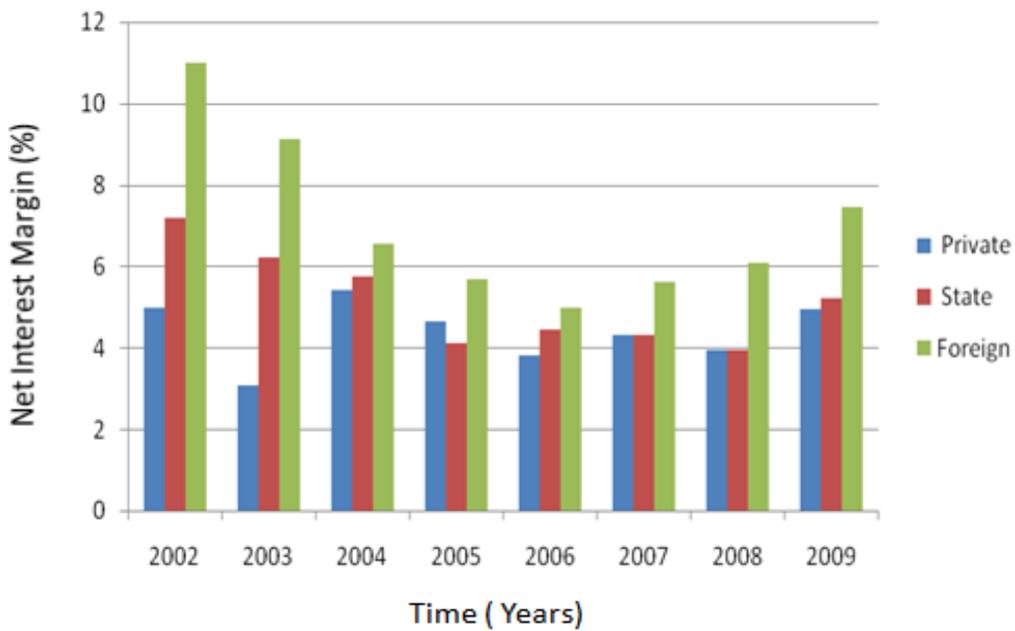
Appendix

Figure 1 : The Evolution of Net Interest Margin



Source: Authors' calculations and Turkish Bank Association

Figure 2: The NIM in terms of Bank Types



Source: Authors' Calculations and Turkish Banking Associations

Table I Statistical Summaries

Variable		Mean	Std. Dev.	Min	Max	Observations	
Net Interest Margin	Overall	1.3999	1.6784	-8.6600	23.0300	N	708
	between		0.6523	-1.1887	2.3533	n	24
	Within		1.5503	-6.0715	22.5956	T-bar	29.5
Inflation	Overall	3.4588	3.2997	-0.3800	15.6340	N	720
	between		0.0000	3.4588	3.4588	n	24
	Within		3.2997	-0.3800	15.6340	T	30
Real GDP Growth	Overall	0.8877	11.5153	-13.5126	21.6566	N	720
	between		0.0000	0.8877	0.8877	n	24
	Within		11.5153	-13.5126	21.6566	T	30
Interbank Rates	Overall	24.6300	13.6520	11.0300	59.0000	N	720
	between		0.0000	24.6300	24.6300	n	24
	Within		13.6520	11.0300	59.0000	T	30
HH Index	Overall	0.1126	0.0110	0.0990	0.1390	N	720
	between		0.0000	0.1126	0.1126	n	24
	Within		0.0110	0.0990	0.1390	T	30
Banking Sector / GDP	Overall	0.2120	0.0401	0.1500	0.3300	N	720
	between		0.0000	0.2120	0.2120	n	24
	Within		0.0401	0.1500	0.3300	T	30
Total Credits / Total Assets	Overall	0.4067	0.1876	0.0010	0.8100	N	708
	between		0.1362	0.0985	0.6072	n	24
	Within		0.1315	-0.0360	0.7565	T-bar	29.5
Market Share	Overall	0.0423	0.0547	0.0000	0.2500	N	720
	between		0.0550	0.0010	0.1875	n	24
	Within		0.0095	0.0008	0.1048	T	30
Liquid Assets / Total Assets	Overall	518.7289	1803.4230	0.0000	7683.8060	N	712
	between		24.7774	495.4704	589.0673	n	24
	Within		1803.2710	-48.5614	7707.0650	T-bar	29.6667
Ratio of off Balance Accounts	Overall	2.3686	2.3236	0.0000	27.6000	N	708
	between		1.5678	0.5773	6.9973	n	24
	Within		1.7328	-3.3488	22.9712	T-bar	29.5
Risk Aversion	Overall	0.1394	0.0829	-0.0330	0.9160	N	708
	between		0.0556	0.0843	0.3017	n	24
	Within		0.0625	-0.0833	0.8351	T-bar	29.5
Ratio of Bad Debt	Overall	8.2883	15.3466	0.0000	125.3690	N	708
	between		8.5216	0.0000	36.8401	n	24
	Within		12.8431	-24.1359	112.2499	T-bar	29.5
Implicit Interest Payments	Overall	0.0105	0.0451	-0.5220	0.2530	N	708
	between		0.0281	-0.1095	0.0640	n	24
	Within		0.0358	-0.4020	0.1995	T-bar	29.5
Reconstruction Dummy	Overall	0.4333	0.4959	0.0000	1.0000	N	720
	between		0.0000	0.4333	0.4333	n	24
	Within		0.4959	0.0000	1.0000	T	30
Crisis Dummy	Overall	0.0333	0.1796	0.0000	1.0000	N	720
	between		0.0000	0.0333	0.0333	n	24
	Within		0.1796	0.0000	1.0000	T	30

Table II Cross Correlation Matrix

	NIM	Inflation	Real Growth	Interbank Interest Rates	Real Interest on Bonds	HH Index	Banking Sector / GDP	Total Assets	Credits Taken	Total Credit / Total Assets	Market Share	Liquid Assets / Total Assets	Ratio of Off-Balance Account	Risk Aversion	Ratio of Bad Debt	Implicit Interest Payments	Reconstruction Dummy	Crisis Dummy
NIM	1.000																	
Inflation	0.278	1.000																
Real Growth	-0.076	-0.427	1.000															
Interbank Interest Rates	0.241	0.789	-0.042	1.000														
Real Interest on Bonds	0.050	0.064	0.196	0.367	1.000													
HH Index	0.194	0.584	0.060	0.827	0.172	1.000												
Banking Sector / GDP	-0.077	-0.273	-0.426	-0.577	-0.423	-0.688	1.000											
Total Assets	-0.046	-0.139	-0.041	-0.223	-0.142	-0.254	0.288	1.000										
Credits Taken	-0.049	-0.139	-0.035	-0.238	-0.170	-0.267	0.304	0.747	1.000									
Total Credit / Total Assets	0.040	-0.370	0.002	-0.530	-0.263	-0.538	0.466	0.045	0.257	1.000								
Market Share	-0.002	0.044	0.004	0.054	-0.004	0.059	-0.026	0.834	0.549	-0.174	1.000							
Liquid Assets / Total Assets	-0.002	-0.119	-0.332	-0.216	-0.154	-0.244	0.644	0.164	0.159	0.162	-0.008	1.000						
Ratio of Off-Balance Accounts	-0.117	-0.209	-0.058	-0.323	-0.187	-0.308	0.326	-0.105	-0.031	0.208	-0.214	0.191	1.000					
Risk Aversion	0.142	-0.031	-0.023	0.014	0.097	-0.007	-0.052	-0.208	-0.133	-0.231	-0.209	0.023	0.219	1.000				
Ratio of Bad Debt	0.118	0.359	-0.020	0.464	0.122	0.439	-0.267	0.019	-0.113	-0.409	0.313	-0.073	-0.234	-0.107	1.000			
Implicit Interest Payments	0.447	-0.008	-0.014	-0.066	0.004	-0.099	0.059	-0.001	0.007	0.214	-0.013	0.052	-0.212	-0.146	0.017	1.000		
Reconstruction Dummy	0.132	0.460	0.045	0.759	0.589	0.707	-0.710	-0.258	-0.291	-0.532	0.030	-0.230	-0.329	0.103	0.343	-0.068	1.000	
Crisis Dummy	0.000	-0.128	-0.333	-0.220	-0.150	-0.245	0.655	0.166	0.159	0.166	-0.007	0.998	0.191	0.021	-0.071	0.050	-0.231	1.000

Table III Regression Results

Dependent Variable: NIM	Independent Variables	Coefficient (Std. Dev)
Macro Economic Variables	Inflation	0.1190 (0.03575)***
	Real GDP Growth	0.0122 (0.0071)*
	Interbank Interest Rates	0.0266 (0.01380)*
Banking Sector Variables	Helfindahl-Hirschman Index	27.0372 (11.8181)**
	Banking Sector / GDP	1.6937 (4.0353)
Bank Specific Variables	Total Credit / Total Assets	1.2234 (0.8643)
	Marketshare	12.2140 (8.1499)
	Liquid Assets / Total Assets	-0.00037 (0.00043)
	Ratio of Off Balance Accounts	-0.01837 (0.03949)
	Risk Aversion	9.1290 (0.9714)***
	Ratio of Bad Debt	-0.00959 (0.0070)
	Implicit Interest Payments	15.7105 (1.5102)***
Binary Variables	Reconstruction Dummy	-0.4386 (0.2532)*
	Crisis Dummy	0.8443 (0.3730)**
	Constant	-5.0100 (2.9516)***
Number of Observations		708
R2	Within	0.3397
	Between	0.9895
	Overall	0.4341
Wald	chi2(15)	354.56
Prob > chi2		0

*, ** and *** correspond to significance levels at 10%, 5% and 1% respectively

Table IV Robustness Tests

Dependent Variable: NIM	Independent Variables	Coefficient (Std. Dev)
Macro Economic Variables	Inflation	0.1169 (0.03575)***
	Real GDP Growth	0.01007 (0.0072)
	Interbank Interest Rates	0.0264 (0.01370)*
Banking Sector Variables	Helfindahl-Hirschman Index	29.6592 (11.8002)**
	Banking Sector / GDP	-0.0824 (4.2025)
Bank Specific Variables	Total Credit / Total Assets	1.2913 (0.8551)
	Marketshare	11.0864 (8.0567)
	Liquid Assets / Total Assets	-0.000043 (0.000043)
	Ratio of Off Balance Accounts	0.0303 (0.0396)
	Risk Aversion	9.1194 (0.9634)***
	Ratio of Bad Debt	-0.00635 (0.0071)
	Implicit Interest Payments	15.8866 (1.5064)***
	Total Assets	0.000015 (0.0000079)*
Binary Variables	Reconstruction Dummy	-0.3861 (0.2524)
	Crisis Dummy	0.8733 (0.3731)**
	Constant	-4.9882 (1.8503)***
Number of Observations		708
R2	Within	0.3465
	Between	0.9903
	Overall	0.4402
Wald	chi2(15)	365.24
Prob > chi2		0

*, ** and *** correspond to significance levels at 10%, 5% and 1% respectively

Table V Robustness Tests

Dependent Variable: NIM	Independent Variables	Coefficient (Std. Dev)
Macro Economic Variables	Inflation	0.1146 (0.03583)***
	Real GDP Growth	0.01005 (0.0072)
	Interbank Interest Rates	0.02732 (0.01374)**
Banking Sector Variables	Helfindahl-Hirschman Index	29.4216 (11.8349)**
	Banking Sector / GDP	0.1659 (4.1932)
Bank Specific Variables	Total Credit / Total Assets	1.2282 (0.8574)
	Marketshare	6.2081 (8.686)
	Credits Taken	0.00011 (0.000061)*
	Liquid Assets / Total Assets	-0.00040 (0.00043)
	Ratio of Off Balance Accounts	0.0306 (0.0397)
	Risk Aversion	9.0756 (0.9656)***
	Ratio of Bad Debt	-0.0078 (0.0070)
	Implicit Interest Payments	15.8028 (1.5060)***
Binary Variables	Reconstruction Dummy	-0.3886 (0.2530)
	Crisis Dummy	0.8800 (0.3733)**
	Constant	-5.0319 (1.8522)***
Number of Observations		708
R2	Within	0.3451
	Between	0.9901
	Overall	0.4389
Wald Prob > chi2	chi2(15)	362.96 0

*, ** and *** correspond to significance levels at 10%, 5% and 1% respectively

Table VI Robustness Tests

Dependent Variable: NIM	Independent Variables	Coefficient (Std. Dev)
Macro Economic Variables	Inflation	0.1359 (0.0363)***
	Real GDP Growth	0.0118 (0.0071)*
	Interbank Interest Rates	0.0184 (0.01431)
	Real Interest on Treasury Bonds	0.0373 (0.01441)***
Banking Sector Variables	Helfindahl-Hirschman Index	38.5963 (12.6753)***
	Banking Sector / GDP	3.2202 (4.1606)
Bank Specific Variables	Total Credit / Total Assets	1.1490 (0.8723)
	Marketshare	12.6165 (8.2521)
	Liquid Assets / Total Assets	-0.000041 (0.000043)
	Ratio of Off Balance Accounts	0.0149 (0.0397)
	Risk Aversion	9.1996 (0.9767)***
	Ratio of Bad Debt	-0.0098 (0.0071)
	Implicit Interest Payments	15.6146 (1.5092)***
Binary Variables	Reconstruction Dummy	-0.6675 (0.2670)**
	Crisis Dummy	0.6974 (0.3746)*
	Constant	-6.7717 (1.9787)***
Number of Observations		708
R2	Within	0.3391
	Between	0.9882
	Overall	0.4332
Wald Prob > chi2	chi2(15)	356.09 0

*, ** and *** correspond to significance levels at 10%, 5% and 1% respectively