IJCEAS

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: 9, Issue: 2, Year: 2019, pp. 428-442
DOI: 10.5281/ zenodo.3596108

THE IMPACT OF FINANCIAL CRISES ON THE COMMERCIAL BANK NET INTEREST MARGINS: EVIDENCE FROM THE TURKISH BANKING INDUSTRY

F. Dilvin TAŞKIN YEŞİLOVA[1]

Received: 23.10.2019, Accepted: 11.12.2019

Abstract

This paper investigates the impact of financial crisis on the determinants of bank interest rate margin (NIM) in Turkey over the period 1995-2018. Turkey witnessed two recent major economic crises, a local crisis in 2001 and the global crisis in 2008. The sample period is divided into three sub-periods: pre-crisis period (1995-2001), post-local crisis period (2002-2007) and post- global crisis period (2008-2018). The NIMs are specified as a function of bank and market-specific variables, such as operating cost, liquidity, credit risk, implicit interest payments, size, managerial efficiency, and concentration. The results of the analysis show that determinants of NIMs following the local crisis and global crisis are significantly changed. After the local crisis credit risk levels were considered more crucial and costs and efficiency is considered as the focus in the aftermath of the global financial crisis.

Keywords: Net interest rate margins; Commercial banks; Financial crisis

JEL classification: G21; G15

Introduction

Turkish economy witnessed two major financial crises in the last two decades; in February 2001 and 2008 global financial crisis along with many other countries in the world. 2001 crisis was a local crisis, which was a result of the overall economic deterioration, high indebtedness and loss of trust to the economy. In the local economic crisis of Turkey, the problems related to the macroeconomic conditions were poor since 1994. The government initiate a disinflation program in

[1] Assoc. Prof. Dr., Department of Business Administration, Faculty of Business, Yaşar University, Turkey. dilvin.taskin@yasar.edu.tr

IJCEAS

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: 9, Issue: 2, Year: 2019, pp. 428-442
DOI: 10.5281/zenodo.

1999, which became a major underlying reason for the crisis. The crisis began in the financial system and later spread to the real sector. The Turkish economy shrunk about 9.4%, a record level of annual output loss in the history of the country. The value of US dollar nearly doubled against Turkish lira and most of the central bank's foreign reserves were eroded whilst managing the crisis. Banking sector that constitute a significant portion of the financial system were highly affected by the crisis since about half of their liabilities were denominated in foreign currencies[2]. In 2001, the commercial banks had to manage high amounts of cash withdraws, decrease the portfolio risk and pay back short-term foreign debt (Kasman, 2003). The size of the sector decreased dramatically about 30% in US dollars terms. Many banks became insolvent and administrations of these banks were taken over by the Saving Deposit Insurance Fund (SDIF)[3]. The underlying reasons of this crisis were the unstable macroeconomic environment, fragility of the banking system, poor banking supervision, and monitoring.

To recover from the crisis, Turkey needed immediate financing, thus a standby agreement was signed with IMF. A significant part of the standby agreement constituted a financial restructuring program that emphasizes the importance of governmental regulation and supervision to enhance the soundness and stability of the Turkish banking system. Hence, a new banking law aimed at improving regulatory and supervisory standards was introduced. Moreover, a new regulatory authority was introduced. Banks that mostly focused on investing the deposits on high interest-bearing government securities started focus on the traditional banking activities and the competition in the loan market was intensified.

The reforms after the local economic crisis had major impacts. Turkey witnessed stable and high growth rates; inflation declined to one-digit level. The improvements in the economy besides the reforms in regulations in banking system enhanced the capital adequacy and the profitability of the Turkish banks to higher percentages than many banks in developed countries. Following the recovery of the Turkish banking system, many foreign banks entered the system to reap the benefits of high profit margins. The competition and the entry of foreign banks led

[2] Financial intermediaries constitute the major source of capital for small and medium-sized firms in Turkey since Turkish stock market lacks depth both in terms of capitalization and participation.
[3] 13 banks were transferred to the SDIF since they could not meet their liabilities. Particularly, the banks with maturity mismatches suffered most from the expansion of their funding costs due to the increase in interest rates.

the way to some mergers and acquisitions in the industry. Banking stability and the pace of the profit margins continued until the global financial crisis that started at the end of 2007. The impacts of the crisis spread to Turkey in the late 2008. Global crisis first eroded the financial industry in many countries and later hit the real economy. This case was just the contrary for Turkey, since the real economy was affected with the decline in the global demand, then the shrinkage in other economies caused the banking system to tremble.

Banks play a key role in economic growth with the flow of funds between lenders and borrowers and receive a reward, called as the net interest margin (NIM hereafter), for performing their intermediating function. Hence, understanding the factors that determine the NIMs is important for regulators, policy makers, bank managers and researchers. Moreover, commercial bank NIMs convey significant information for the efficiency of the banking system (Demirguc-Kunt and Huizinga, 1999). Therefore, the main objective of this paper is to investigate the behavior of commercial bank NIMs for the Turkish banking over the period 1995-2018 by dividing the period as pre-local crisis, post local crisis and post global crisis. Particularly, we use the dealership model proposed by Ho and Saunders (1981) and its extensions by McShane and Sharpe (1985), Allen (1988), Angbazo (1997) and more recently Maudos and Guevara (2004).

The contribution of this paper is two-fold: First, the studies on the bank NIMs in the literature mostly concentrated on the banking markets in developed countries. This study, however, focuses on an emerging market and investigates impacts of a local financial crisis as well as the global crisis on the determinants of NIMs[4]. Evidence from an emerging market is also crucial for other emerging countries, which suffer from local and global financial crisis. Secondly, financial intermediation, which constitutes more than 80% of the financial system, plays a key role in Turkey. Hence, investigating the behavior of NIMs in this country would reveal important information about the efficiency of the system[5]. Moreover, to the authors' best knowledge, no study has examined the

[4] Saunders and Schumacher (2000) discuss that in emerging economies, relatively high margins are necessary, since it may bring a degree of stability for a banking system and banks may expand their profitability and their capital bases and therefore, they are segregated from macro shocks.

[5] Since the NIM is also of importance for bank profitability, banking market stability and competition, examining how it is determined and how it adjusts itself to the new regulatory and economic environment in an emerging economy is crucial for the policy makers, bank managers and researchers.

IJCEAS
International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: 9, Issue: 2, Year: 2019, pp. 428-442
DOI: 10.5281/zenodo.

behavior of NIMs using data from the Turkish banking market by comparing the impacts of the two different crises.

The rest of the paper is organized as follows: Section 2 provides a brief review of the literature. Section 3 discusses the methodology followed. Section 4 describes the data used in the analysis and presents the empirical results. Section 5 draws conclusions.

Brief Literature Review on NIMs

The seminal paper by Ho and Saunders (1981) integrates the hedging and the expected utility hypothesis into an analysis of the determinants of the NIM. The dealership approach shows that the NIM depends on the degree of managerial risk aversion, the size of the bank's transactions, the market structure in the banking industry and the variance of interest rates.

Following Ho and Saunders (1981), Angbazo (1997) concentrated on different size classes of banks to examine the effect of default and interest rate exposure on the NIM. The findings reveal that banks with more risky loans and higher interest-rate risk exposure tend to achieve higher NIMs. Additionally, the NIM is positively related to core capital, non-interest-bearing reserves and management quality, and negatively related to liquidity.

Demirgüç-Kunt and Huizinga (1999) used bank-level data for 80 countries over the period 1988-95 and concluded that macro determinants like bank taxation, regulations, overall financial structure and legal indicators are also effective in explaining the NIM. Saunders and Schumacher (2000) applied Ho and Saunders (1981) model on six European countries and the US for the period 1988-1995. Decomposing the bank margins into regulatory, market structure and risk premium components, their results indicate that the regulatory components and the interest-rate volatility are positively related to the NIM.

There are several studies concerning the determinants of the NIMs in Europe. Unlike Saunders and Schumacher (2000), Maudos and Guevara (2004) investigated the behavior of NIMs in the several European banking sectors for the period 1993-2000, using a single stage model, and obtained that the merger waves in 1990s reduced the competition, thus led to an increase in market power and increase in the NIMs. Introducing the impact of operating costs to their model, they suggest that the decrease in the operating costs due to the concentration and the decrease in the implicit interest payments due to the increase in the importance of banking commissions had a decreasing effect on the

NIMs in the sampled European banks. Abreu and Mendes (2003) studied four EU countries for the period 1986-1999. Their results suggest that well capitalized banks have lower solvency exposures, thus lower expected bankruptcy costs, which lead them to higher profitability. The unemployment rate and the inflation are also relevant in explaining the bank profitability.

Claeys and Vander Vennet (2008) analyzed the behavior of NIMs in the Central and Eastern European countries for the period 1994-2001. Particularly, they examined the similarities and the differences between the Western Europe, accession and non-accession countries with respect to the determinants of NIMs. Operational efficiency is negatively related to NIM in Western Europe and accession countries, but not in non-accession countries. The NIM is found to be positively related to the capital adequacy levels and operational efficiency. Valverde and Fernandez (2007) considered the non-traditional activities of the European banks in their model. Their results suggest that revenue for non-traditional business may compensate for the lower margins that resulted from stronger margins in traditional segments. Adversely, banks that show a higher degree of specialization in the lending activities tend to exhibit lower margins.

A few papers concentrated on developing countries. Brock and Suarez (2000) examined the determinants of NIMs in five Latin American countries, using two-step procedure. Their results indicate that high operating costs is the common determinant of the NIMs in all countries. Also, in some countries the reserve requirements and the liquidity ratio are leading to high NIMs. Contrary to the empirical results of studies on developed countries, non-performing loans are found to be associated with smaller spreads, which is explained by the inadequate provisioning for loan losses.

Gischer and Jüttner (2002) investigated the determinants of NIMs in the OECD countries, using the dealership model. Different from the other studies in the literature, they provided a proxy measure for competition in global markets by introducing the ratio of total foreign assets and liabilities to GDP. Their results suggest that the competition and the fee-to-interest income ratio are negatively related to the NIM. The gross income, however, has positive impact on the NIM.

Hawtrey and Liang (2008) investigated the NIMs in a set of OECD countries, and their evidence supports that scale effects proxied by the volume of the loans and managerial efficiency have decreasing effect on

IJCEAS
International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: 9, Issue: 2, Year: 2019, pp. 428-442
DOI: 10.5281/zenodo.

the NIM. Operating expenses, implicit interest payments and market power, however, are positively related to the NIM.

Doliente (2005) examined the determinants of the NIM in the banking sectors of Southeast Asian countries. Their results indicate that the capital ratio and operating expenses are positively related to the NIM. Liquidity, loan quality and operating expenses and interest rate volatility are found to be the significant parameters in explaining the behavior of NIM in these countries.

Williams (2007) applied the Ho and Saunders (1981) model to the Australian banking industry to investigate the determinants of NIM for the period 1989-2001. Particularly, he compares the differences between domestic and foreign banks. The results indicate that market power, operating costs, implied interest payments and management quality are positively related to the NIM. The results also reveal that the foreign banks had significantly lower NIMs than the domestic banks.

Drakos (2003) analyzed the determinants of NIM in the Central and Eastern European countries and Former Soviet Union countries during the transition period. The results indicate that the transition process has been effective in decreasing the margins in these countries. The ownership status is also of importance for determining the margins, since state-owned banks imply narrower margins.

There are a few papers focusing on the determinants of NIMs in Turkish banking. Ugur and Erkus (2010) apply panel regressions and find that market share and management quality decrease NIMs and operating costs, risk aversion and bank size increase NIMs. They also point to the fact that foreign banks charge higher NIMs. Findings of Kansoy (2012) suggest that operation diversity, credit risk and operating costs are significant determinants of NIM. Yüksel and Zengin (2017) analyze the 2003-2014 period and suggest that NIMs is negatively related with non-interest income and non-performing loans, total assets and exchange rates. These papers focused on the determinants of NIMs without considering the impact of the crisis. Thus, this paper aims to fill this gap by dividing the observation period taking the local and the global crisis into consideration.

Methodology

The models employed in the literature for the analysis of the determinants of NIM are based on the dealership model proposed by Ho and Saunders (1981) and its subsequent extensions. There are two empirical approaches in the estimation of net interest rate margin by

using the dealership model of Ho and Saunders (1981). The first alternative is the two-step approach. The first step involves the estimation of a 'pure spread' by regressing observed margins on several bank-specific explanatory variables. In the second step, the estimated spread explained by macroeconomic and market structure variables. The main advantage of this model is that it allows 'pure' margin to be estimated. One of the drawbacks of this model is that it does not consider the possible heterogeneity across banks. Moreover, this model also requires a time series long enough to be able to estimate the 'pure' margin. An alternative approach found in the related literature is a single-stage regression technique based on a behavioral model of the banking firm in which various potential determinants of the net interest margin are included. Since this paper deals with bank-specific variation within the same country and uses a short period of time, a single-step estimation approach is used to analyze the determinants of net interest margin in Turkey (see Angbazo, 1997; Demirguc-Kunt and Huizinga, 1999; Drakos, 2003; Maudos and Guevara, 2004).

The NIMs are generally expressed as a function of bank-specific explanatory variables. Following the approach commonly used in the literature, we specify net interest margin as a function of bank-specific variables, such as operating cost, liquidity risk, credit risk, implicit interest payments, size and managerial efficiency, and the degree of concentration, Lerner index. The definitions and expected signs of bank-specific variables and the concentration are presented in Table 1.

Table 1: Description of variables

Variable	Definition	Expected Sign
Net Interest Margin: *NIM*	Difference between interest revenue and interest expenses per dollar of assets	Dependent variable
Foreign Bank Dummy: *DumF*	*DumF* = 1 if foreign bank; *DumF* = 0 otherwise	(-)
Market Structure: *Lerner Index*	$Lerner = \frac{Total\ \text{Revenues} - Total\ Costs}{Total\ \text{Revenues}}$	(+)
Operating Costs: *OC*	Operating Costs/ Total Assets	(+)

IJCEAS

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: 9, Issue: 2, Year: 2019, pp. 428-442
DOI: 10.5281/zenodo.

Credit Risk: *CR*	Total Loans / Total Assets	(+)
Economies of Scale. *Size*	Natural logarithm of total loans	(-)
Implicit Interest Payment: *IIP*	$IIP = \frac{Operating\ Cost - Non - Interest\ Income}{Total\ Assets}$	(+)
Opportunity Cost of Holding Excess Cash: *Liquid*	Cash/Total Assets	(+)
Other Earning Assets: *SEC*	Total Securities / Total Assets	(+)
Managerial Efficiency: *EFF*	$EFF = \frac{Operating\ Cost}{Gross\ Income}$	(-) / (+)

The fixed effects model of panel data is used to analyze the impact of financial crisis of 2001 on the determinants of commercial bank net interest margins in the Turkish banking industry. The fixed effects model has several advantages. First, by including banking firm fixed effects, unobserved heterogeneity can be controlled[6]. All bank-specific, non time-varying determinants of NIMs not explicitly addressed in the regression specification are captured by the fixed effects. Second, panel estimation allows us to obtain more reliable estimates by observing the behavior of banks over time and testing for changes in the coefficients. Our empirical model is specified as follows:

$$NIM_{it} = \beta_1 + \beta_2 OC_{it} + \beta_3 CR_{it} + \beta_4 IIP_{it} + \beta_5 Size_{it} + \beta_6 EFF_{it} + \beta_7 Lerner_{it} + \beta_8 Liquid_{it} + \beta_9 SEC_{it} + \beta_{10} DumF_t + \varepsilon_{its} \quad (1)$$

where NIM_{it} is the net interest rate margin of bank *i* at time *t*.

[6] This is important because OLS regression is biased if a variable is omitted that is related to the dependent variable.

Data and Empirical Results

Data

The data for this study is taken from the Turkish Banking Association's annual publication, *Banks in Turkey*. This publication presents the financial statements of the banks operating in the Turkish banking industry.

The sample is divided into three sub-periods, pre- local crisis period (1995-2000), post- local crisis period (2002-2007) and post-global crisis period (2008-2018). The data is screened for reporting errors, inconsistencies, missing values and extreme values. Table 2 provides summary statistics for the three sub-periods.

On average, NIMs in the pre-crisis period is much higher (10.44%) than in the post-crisis periods (4.87% and 3.89%). Moreover, margins are much more volatile in the pre-crisis period. Lerner Index displays that the concentration in the market has increased slightly after 2001 crisis. Managerial efficiency has also increased post-crisis period. In conclusion, the summary statistics indicate an improvement in the Turkish banking industry on average in post-crisis periods.

Table 2: Summary statistics of the variables used in the regression

	Pre-crisis period: 1995-2001		Post-local crisis period: 2002-2007		Post- global crisis Period: 2008-2018	
	Mean	Stdev	Mean	Stdev	Mean	Stdev
NIM	10.44	6.34	4.87	4.06	3.89	2.67
Lerner	23.52	16.17	24.75	12.17	14.75	0.20
OC	5.35	2.6	4.79	2.14	4.43	0.02
CR	34.70	14.31	37.46	18.34	54.67	0.20
Size	6.73	1.53	7.69	2.02	6.70	1.09
IIP	4.87	4.96	0.58	4.84	0.01	0.007
Liquid	3.43	2.58	5.03	4.54	3.63	0.20
SEC	16.73	12.18	8.52	14.34	20.1	4.67
EFF	22.85	10.02	29.22	11.01	4.42	0.023

Note: *NIM, Lerner, OC, CR, Size, IIP, Liquid, SEC,* and *EFF* denote the difference between interest revenue and interest expenses per dollar of assets, the difference betweeen total revenue and total cost divided by the total revenue, the ratio of operating

IJCEAS

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: 9, Issue: 2, Year: 2019, pp. 428-442
DOI: 10.5281/zenodo.

expenses to total assets, the ratio of total loans to total assets, the natural logarithm of total assets, the difference between operating expense and non-interest revenue divided by total assets, the ratio of cash assets to total assets, the ratio of other earning assets to total assets, and the ratio of operating cost to income as a measure of quality of management, respectively.

Stdev stands for standard deviation.

Empirical Results

Following the recent empirical literature on the determinants of bank NIMs, the econometric model specified in Eq. (1) is estimated using the fixed effects panel data model to control for unobserved heterogeneity.[7] The choice of the fixed effects over the random effects estimators is based on the result of the Hausman test. All variables are positively related to the NIMs except credit risk, managerial efficiency and the ratio of total securities to total assets in the pre-local crisis period. In contrast to related literature, ownership dummy, *dumF*, is positively and significantly related with the NIMs in the pre- local crisis period. The positive relationship is not surprising for Turkey for the period between 1995 and 2000 since the foreign banks in this period were mostly one-branch banks established with the purpose of investing in government bonds and operating in wholesale market. In the post- local crisis period, however, the foreign bank dummy is not statistically significant reflecting the developments in the post crisis period. In this period, the share of foreign banks in the banking market increased to 40 percent compared to 4 percent in the 1990s. The foreign banks are considered to increase the competition in the system. However, dummy variable for the foreign banks is still insignificant in the post-global crisis period. This result can be explained by the loss of power of foreign banks' headquarters as a result of the global crisis.

Lerner Index, which is a proxy for the market power, is positively and significantly related with the NIMs in the pre- and post- local crisis periods, implying that banks with monopoly power can charge higher loan rates and offer lower deposit rates. This variable became statistically insignificant in the post- global crisis period and the size of coefficient for Lerner index decreased between the pre and post local crisis periods, suggesting that the Turkish banking system has become more competitive in the post- local crisis period. As expected, the impact of operating cost (*OC*) on the NIMs is positive and statistically significant at

[7] To correct for standard errors, the White's (1980) heteroscedasticity consistent *t*-statistics were used.

conventional levels in two periods, suggesting that banks charge higher interest margins as their operating costs increases as previously found by Brock and Suarez (2000), Abreu and Mendes (2003), Maudos and Guevara (2004) and Hawtrey and Liang (2008).

Commercial bank NIMs are expected to be positively related to credit risk (*CR*), which suggest that banks demand higher interest to compensate for exposure to expected and unexpected credit risk. The results indicate that the credit risk has a negative but statistically insignificant coefficient in the pre-crisis period. However, it has a positive and statistically significant coefficient in the post-crisis period, suggesting that increased credit risk may cause an increase banks' interest rate margin. These results are in line with the findings of Maudos and Guevara (2004) and Hawtrey and Liang (2008).

The log of volume of loans as a proxy of size of the operations (*Size*) has a positive but statistically insignificant coefficient in the pre-crisis period. However, in the post-crisis period, the size is negatively and significantly related to the NIMs, suggesting that increased volume of loans may result in a reduction of unit, which achieves scale efficiencies. Table 3 shows that the average size of bank increased over the period between 2002 and 2007, resulting in narrower margins.

As for the implicit interest payments (*IIP*), it has positive and significant coefficients in two periods. This result suggest that banks offer free banking services instead of remunerating deposits explicitly by paying an interest rate, leading higher interest margins. The effect of implicit interest payment on net interest margin in the post crisis period decreased slightly, which implies that the banking system converting to a more transparent fee charging mode. The liquidity is measured as the ratio of cash to total assets (*Liquid*). High liquidity ratio, whether self imposed or the result of regulations, inflicts a cost on banks as they must give up the opportunity of investing these funds in alternate high yielding assets, like loans. Hence, the expected sign on the coefficient is positive. If banks intermediation cost is high, they are likely to offset it by charging their customers higher spread. The result indicates that the liquidity is positively and significantly related to the NIMs in the pre-crisis period, suggesting that as the liquidity increases, the bank's appetite for deposits decreases and therefore the bank pays less on deposits thereby increasing the NIM. However, in the post-crisis period the impact of liquidity on the NIMs is positive but statistically insignificant. The impact of the ratio of total securities to total asset

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: 9, Issue: 2, Year: 2019, pp. 428-442
DOI: 10.5281/zenodo.

(*SEC*) is also investigated[8]. The result indicates that the *SEC* has unexpected sign but insignificant coefficient in the pre-crisis period. However, it has an expected positive sign and is also statistically significant in the post-crisis period, suggesting that as the securities increases, the bank's desire to sell loans decreases and hence charge higher interest rate on loans thereby increasing the NIM.

Table 3 also shows that the managerial efficiency (*EFF*) measured by the ratio of operating cost to income has negative and statistically significant impact on the NIMs in two periods as expected. This result implies that higher managerial efficiency stimulates banks to offer higher deposit rates and lower loan rates to their clients. This result is in line with the findings of Angbazo (1997), Hawtrey and Liang (2008), and Maudos and Guevera (2004) but inconsistent with Gischer and Juttner (2002).

Table 3: Panel data regression results

	Pre-crisis period: 1995-2001			Post-local crisis period: 2002-2007			Post- global crisis Period: 2008-2018		
Variable	Coef.	t-stat	Prob.	Coeff.	t-stat	Prob.	Coeff.	t-stat	Prob.
DumF	0.017*	2.801	0.006	0.004	1.509	0.134	0.088	0.358	0.721
Lerner	0.232*	13.699	0.000	0.171*	11.317	0.000	1.349	0.993	0.322
OC	0.909*	8.557	0.000	0.445*	5.490	0.000	70.436**	2.280	0.023
CR	-0.007	-1.481	0.140	0.041**	2.295	0.023	1.354	0.852	0.395
Size	0.007	1.424	0.156	-0.023**	-2.297	0.023	-1.515**	-2.533	0.012
IIP	0.911*	22.998	0.000	0.787*	20.504	0.000	21.822	0.275	0.783
Liquid	0.019**	2.164	0.032	0.004	0.243	0.808	0.906	0.494	0.622
EFF	-0.205*	-10.253	0.000	-0.075*	-6.799	0.000	-3.594***	-5.024	0.000
SEC	-0.003	-0.253	0.800	0.020*	3.068	0.003	-0.511	-0.384	0.701
Constant	-0.019	-1.184	0.238	0.048**	2.402	0.018	7.417**	2.285	0.023
Adj R-squ.	0.6619			0.652			0.665		
F-stat	0.000			0.000			0.000		

Note: *NIM, Lerner, OC, CR, Size, IIP, Liquid, SEC, EFF,* and *DumF* denote the difference between interest revenue and interest expenses per dollar of assets, the

[8] It includes all earning assets other than loans.

difference betweeen total revenue and total cost divided by the total revenue, the ratio of operating expenses to total assets, the ratio of total loans to total assets, the natural logarithm of total assets, the difference between operating expense and non-interest revenue divided by total assets, the ratio of cash assets to total assets, the ratio of other earning assets to total assets, the ratio of operating cost to income as a measure of quality of management, and dummy variable for ownership type, respectively.

*, ** and *** denote significance level at 1%, 5% and 10%, respectively

Conclusions

This paper has examined the impact of the financial crisis of 2001 on the determinants of the net interest margins in the Turkish industry for the period 1995-2018. The sample period was divided into three sub-periods: pre-crisis period (1995-2001) and post- local crisis period (2002-2007) and post- global crisis period (2008-2018). We specified the net interest margins (NIM) as a function of bank and market-specific variables, such as operating cost, liquidity, credit risk, implicit interest payments, size, managerial efficiency, and Lerner index.

The results of the analysis show that Lerner index is a factor increasing the net interest margins charged by the banks in both pre-local crisis and post-local crisis periods. This variable is insignificant in the aftermath of the global crisis, suggesting that market power is not a significant factor for changing the margins charged by banks. Following the global financial crisis, the rules of the game has changed in the banking industry. Implicit interest payments is significant for the pre and post- local crisis periods and insignificant for the post-global crisis period. Operating costs are significant in all three periods, suggesting that they are significant determinants of bank interest margins, independent of the economic state. This finding is also supported by the managerial efficiency variable. In all three periods, managerial efficiency has a suppressing impact on the NIMs. The size of the bank has a negative and significant coefficient in the post-local and post-global financial crisis, pointing to the fact that, greater banks charge less interest margins following the both crises.

Overall, the results suggest that many determinants of net interest margins became insignificant after the global financial crisis. Banks are more cost and efficiency oriented following the global crisis. In the domestic crisis case, many determinants were significant in explaining the net interest margins, like the securities portfolio, market power, credit risk, as well as the costs. The local crisis caused the banks to be more cautious about their credit risk levels, whereas the global crisis started a different era in the banking system, by making the costs and the

International Journal of Contemporary Economics and Administrative Sciences
ISSN: 1925 – 4423
Volume: 9, Issue: 2, Year: 2019, pp. 428-442
DOI: 10.5281/zenodo.

efficiency as the focus of the Turkish banking industry. The results of the paper moreover suggest that, NIMs charges by banks tend to decline over time, which is because of the integration of the financial markets. The results of the paper are important for policy makers and bank managers. Bank managers and policy makers should design strategies to decrease the costs of the banking system. Moreover, credit risk is not a factor in explaining NIMs, which points to the fact that several precautions should be considered to prevent any possible problems.

References

Abreu, M. and Mendes, V. (2001) Commercial bank interest margins and profitability: evidence from some EU countries'', paper presented at the Pan-European Conference Jointly Organized by the IEFS-UK and University of Macedonia Economic and Social Sciences, Thessaloniki, 17-20 May.

Allen, L. (1988) The determinants of bank interest margins: A note, *Journal of Financial and Quantitative Analysis,* 23, 231-235.

Angbazo, L. (1997) Commercial bank net interest margins, default risk, interest-rate risk and off-balance sheet banking, *Journal of Banking & Finance,* 21, 55-87.

Brock, P. R. and Suarez, L. R. (2000) Understanding the behavior of bank spreads in Latin America, *Journal of Development Economics,* 63, 113-134.

Claeys, S. and Vander Vennet, R. (2008) Determinants of bank interest margins in Central and Eastern Europe: A comparison with the west, *Economic Systems,* 32, 197-216.

Demirguc- Kunt, A. and Huizinga, H. (1999) Determinants of commercial bank interest margins and profitability: some international evidence, *World Bank Economic Review,* 13, 379-408.

Doliente, J. S. (2005) Determinants of bank net interest margins in Southeast Asia, *Applied Financial Economics Letters,* 1, 53-57.

Drakos, K. (2003) Assessing the success of reform in transition banking ten years later: an interest margin analysis, *Journal of Policy Modeling,* 25, 309-317.

Gischer, H. and Juttner, D. J. (2002), Global competition, fee income and interest rate margins of banks, *Financial Management Association Conference,* Copenhagen.

Hawtrey, K. and Liang, H. (2008) Bank interest margins in OECD countries, *North American Journal of Economics and Finance,* 19, 249-260.

Ho, T. and Saunders, A. (1981). The determinants of bank interest margins: theory and empirical evidence, *Journal of Financial and Quantitative Analysis,* 16, 581-600.

Kansoy, F. (2012). The Determinants of Net Interest Margin in the Turkish Banking Sector: Does Bank Ownership Matter? *Journal of BRSA Banking and Financial Markets*, 6(2), 13-49.

Kasman, A. (2003) Banking efficiency during the financial crisis period, *ISE Review,* 7, 83-97.

Levine, R. (1997) Financial development and economic growth: views and agenda, *Journal of Economic Literature,* 35, 688-726.

Maudos, J. and Fernandez de Guevara, J. (2004) Factors explaining the interest margin in the banking sectors of the European Union, *Journal of Banking and Finance,* 28, 2259-2281.

McShane, R. W., and Sharpe, I. G. (1985) A time series–cross section analysis of the determinants of Australian trading bank loan–deposit interest margins: 1962–1981, *Journal of Banking and Finance*, 9, 115-136.

Saunders, A., and Schumacher, L. (2000), The determinants of bank interest rate margins: An international study, *Journal of International Money and Finance*, 19, 813–832.

Valverde, S.C. and Fernandez F.R. (2007) The determinants of bank margins in European banking, *Journal of Banking and Finance*, 31, 2043-2063.

Williams, B. (2007) Factors determining net interest margins in Australia: domestic and foreign banks, *Journal of Financial Markets, Institutions & Instruments,* 16, 145-165.

Yildirim, H.S. and Philippatos, G.C. (2007) Efficiency of banks: recent evidence from the transition economies of Europe 1993-2000, *European Journal of Finance,* 13, 123-143.

Yuksel, S. and Zengin, S. (2017). Influencing Factors of Net Interest Margin in Turkish Banking Sector, *International Journal of Economics and Financial Issues,* 7(1), 178-191.