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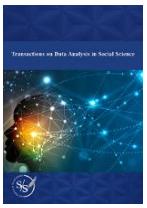

Measuring the impact of the (2011-2012) financial crisis on the relationship between financial ratios and bank profits

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ABSTRACT

This study aims to investigate the impact of bank financial ratios on performance during periods of financial crisis. Using data from 19 banks listed on the Tehran Stock Exchange between 2009 and 2014, a multivariate regression model was applied to test the proposed research hypotheses. The analysis included descriptive statistics, correlation coefficients among variables, and hypothesis testing to interpret the relationships between financial indicators and bank performance. The selected financial ratios, including liquidity, leverage, asset quality, and profitability measures, were examined to determine their predictive power in crisis conditions. The empirical findings revealed that financial ratios significantly influence bank performance; however, the nature and strength of these effects vary depending on the severity of the crisis. Specifically, the relationship between financial ratios and profitability was found to be moderately mediated by the crisis context, indicating that economic instability alters the traditional performance dynamics of banks. Overall, the results emphasize the importance of robust financial management and ratio monitoring as effective tools for enhancing banking resilience during financial turmoil.

1. INTRODUCTION

In the last decade, the banking industry in the world has experienced dramatic changes in the deregulation and globalization of financial markets. In response to the liberalization of the financial sector, the banking system seems to have become the most influential sector in the economy. With the development of this large institution, the profitability of banks has been affected in all countries and the increase in the credit ratio of customers' deposits to make profit through activities in financial markets and securities is recognized as a competitive advantage in the

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performance of banks by analysts. Recent financial crises have put banks into trouble in terms of profitability and a set of risks; so that the performance of banks has become a significant issue for economists and policymakers with regard to the role of banks in the core of economic and financing activities. In order to stabilize the banking system, determining the bank's profitability factors is among the most important research fields applicable to bank managers and banking supervisory committees. Profitability and performance of the bank can be affected by internal and external factors [1-4].

Internal factors are bank-specific features that affect the performance of the bank. Many studies related to determinant factors of bank performance have focused on factors related to the bank, industry, and macroeconomic background. In this regard, economic theory suggests that market structure has an impact on firm performance, as larger institutions and organizations have the ability to provide services at a lower cost until economies of scale exist.

2. STATEMENT OF THE PROBLEM

One of the necessary and effective tools for economic development in the country is the existence of efficient banking system. Banks are the heart of financial activity, and the situation prevailing on them can have an important impact on other sectors of the society's economy. Banks, by organizing and directing receipts and payments, facilitate trade and commerce exchanges, lead to market expansion, and boost economic growth. This issue is especially important for Iran, where there is no market for debt. In Iran, banks act as the only provider of funds and their sustainability is the most important challenge in the country's financial system.

The primary purpose of banking management, like any other business, is to achieve profit, as it is a fundamental requirement for all profit-making activities [5]. At a large scale, a profitable and strong banking system can better resist the negative impacts of the market and stabilize the financial system of an economy.

Iran in the field of financial development is ranked among the countries with a low level of development. Low financial depth is responsible for the ineffective apportion of financial resources and the unfavorable situation of financial development in Iran comparable to countries such as Pakistan, India and the United Arab Emirates which are among the countries with a very low level of financial development. Based on this, low efficiency of banks has been one of the most important factors limiting financial development of the country.

Inefficiencies in the banking system of Iran are caused by factors that can be rooted in very different parameters. The efficiency of banks relies on factors such as the level of economic development of the country, the level of development of laws and regulations governing capital markets and financial markets, attention to the industry of financial intermediaries and its development, and the optimal management of resources by banks.

Now, one can ask what factors affect the profitability of banks in Iran. And how can these factors be managed and used to maximize the profit of the bank as a business entity? In response to this question, several studies have examined the impact of some factors on micro and macro levels such as liquidity risk, credit risk, assignment facilities, capital structure, interest rates, and inflation rates on bank profitability.

3. BACKGROUND RESEARCH

Rezaei and Saadi examined the relationship between market efficiency and banking system performance. For this purpose, a simple Korno model was used and then, in the framework of an econometric model, the hypotheses about the market structure and the profitability of the banking system in different countries were tested.

The results showed that among the variables related to the market, the greater the market share becomes, in both performance indicators, meaning the profitability and profit margin, the more positive impact will be resulted.

Taheri Tafreshi [6] in a study entitled The Impact of Private Banks' Arrival on the Structure and Function of the Banking Industry in Iran, examined the impact of private banks' arrival on the structure and performance of Iran's banking industry for a sample of five commercial banks in the period from 1989 to 2008, using the combined data regression equations. In order to measure the structure of the banking industry, he used the Ross-Panasonic statistical methodology to analyze the performance of banks. His research findings show that the structure of the banking industry in Iran was monopoly and with the arrival of private banks in 2002, the degree of monopoly was reduced,

but the hypothesis of improving the performance of government banks after the arrival of private banks was not confirmed.

Nazarian [7] examined the effect of competition on the effectiveness of transferring monetary policy through the lending channel in Tehran Stock Exchange banks. Therefore, a two-step panel estimation method for bank level data including balance sheet and profit and loss of Iranian banks during the years 1996-2010 was used. In this regard, in the first step, using the Panza and Ross method, the degree of competition was measured and in the next step, its relation with loan growth was estimated. The results showed that there was a direct relationship between these two variables and that it strengthened the effectiveness of monetary-financial policy through the bank's lending channel by increasing competition in banking.

Ahmadi investigated the impact of credit risk on the performance of the banking system of the country, as well as the comparison of credit risk in public and private banks over a period of time. In this regard, the self-panel regression method has been used. The results showed that a momentum as big as a standard deviation in credit risk would lead to a decrease in banks' liquidity, asset returns and profitability. Based on the results, in long term, credit risk does not play a role in determining the profitability of banks, but liquidity and asset efficiency of banks in long term are significantly affected by credit risk.

Tan and Flores [1] in another study, using the one-step GMM method, examined the impact of the GDP growth on the profitability of China's banks. The results of this study showed that commercial banks had less profitability during economic growth.

Tan and Flores [2] applying one-step and two-step GMM method, in evaluating the stock market fluctuations on banking performance from 2003 and 2009, used four performance criteria including return on investment (ROE), economic return on equity (EROE)), net interest margin (NIM) and economic value added (EVA). And the results showed that public and private banks with a higher tax expense would be less profitable.

Tan [4] conducted a comprehensive study of the impact of risk and competition on banks' profitability in China. The results of the research by using one-step GMM method during the years 2003 to 2011 showed that the effect of risk and competition on the profitability of banks was not significant. In addition, among the factors including bank-specific, industry-specific, and macro factors, variables such as tax, overhead costs, employee productivity, and inflation are effective on bank profitability.

In 2014, Dietrich and Vanzyrd [8] surveyed 10165 banks in 118 countries, and assessed the influential features on bank profitability using dummy variable method. In his review, he used the approach of dummy variables and compared the periods of crisis and non-crisis and examined the results for each of the variables separately.

In 2015, John Lee et al. studied the impact of the 2007-2009 financial crisis on the performance and profitability of 418 US banks over the 20-year period from 1994 to 2013. In his research, he examined the effect of 21 independent variables (Bank characteristics, industry characteristics, and macroeconomic variables) on dependent variables of return on assets, return on equity and net profit margin in the three pre-crisis, post-crisis and in-crisis periods, and compared the results with previous research. In his study, only one factor (efficiency ratio) experienced a consistent (negative and meaningful) relationship in all three periods. The reserve variable for credit losses had a negative and meaningful relationship with the two criteria of profitability of return on assets and return on equity in all three periods and had a direct and meaningful relationship with profitability criterion of net profit margin during the pre-crisis period. And other variables also showed different relationships.

4. RESEARCH HYPOTHESES

The hypotheses of this research include:

Hypothesis 1: The relationship between the efficiency ratio and the profitability of the bank is affected by the crisis.
Hypothesis 2: The relationship between the ratios of equity to assets with the profitability of the bank is affected by the crisis.
Hypothesis 3: The relationship between the reserve ratio for credit losses and the profitability of the bank is affected by the crisis.

Hypothesis 4: The relationship between non-operating assets and the profitability of the bank is affected by the crisis.
Hypothesis 5: The relationship between net expenses and profitability of the bank is affected by the crisis.
Hypothesis 6: The relationship between the ratio of non-interest income to revenue and the profitability of the bank is affected by the crisis.

5. RESEARCH METHODOLOGY

This research is in the field of empirical accounting research and is applicable. This research is periodic because it studies data related to specific time periods. And since the results obtained in this study can be used in the process of using financial information, it is considered to be an applied research. Also, considering that the purpose of this study is to investigate the effect of financial ratios on bank performance in crisis situations, it is a kind of correlation-regression analysis.

1.1. Statistical population, test period and sample

The statistical population of this study is the banks accepted in Tehran Stock Exchange and in the time period between 2009 and 2014. The period studied in this research is from the selected statistical population of fiscal years from 2009 and 2014.

The statistical sample includes all Iranian banks whose financial information was published by the central bank from 2009 to 2014. According to the above conditions, 19 banks were selected.

Because we used a census instead of sampling, we assumed the acceptable statistical error level 0.1.

1.2. Experimental model and variables

1.2.1. Hypothesis test model

To investigate the first hypothesis of the research, we examine the following model:

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 ERATIO_t + \alpha_3 EA_t + \alpha_4 RCL_t + \alpha_5 NPA_t + \alpha_6 NCO_t + \alpha_7 NIIR_t + \alpha_8 L\text{-}AT_t + \alpha_{13} LA_t + \alpha_{14} EG_t + \alpha_{16} LG_t + \alpha_{17} CA_t + \varepsilon_t \quad (1)$$

In this model NIM_t is the financial performance of the bank; NIM_{t-1}, is the financial performance of the bank related last year.

1.2.2. Research variables

Variables including independent, dependent, and control, are described in Table 1.

Table 1. Summary of variables

Variable name	Type of variable	calculation method	data	Source of extraction
Net interest margin	Dependent	$NIM = \frac{\text{Net interest income}}{\text{Average assets}}$	Net interest Average assets	Balance sheet and profit and loss statement
Efficiency ratio	Independent	$ERATIO = \frac{\text{Non} - \text{interest expense}}{\text{Total revenue}}$	Non-interest expense, total income	Profit and loss statement
Equity to Assets	Independent	$EA = \frac{Equity}{\text{Total assets}}$	Non-interest expense, total income	Balance sheet
Reserve for credit losses	Independent	$RCL = \frac{\text{allowance for doubtful accounts}}{total\ costs}$	Sale of the beginning of the period Sale of the end of the period	Balance sheet and profit and loss statement
Non-operating assets	Independent	$NPA = \frac{Non - operating\ assets}{Total\ assets}$	Non-operating assets Total assets	Balance sheet
Net Costs	Independent	$NCO = \frac{Total\ costs}{Granted\ facilities\ and\ claims}$	Total costs Granted facilities and claims	Balance sheet and profit and loss statement
Profit in addition to interest per income	Independent	$NIIR = \frac{Non - interest\ income}{Net\ interest\ income + Non - interest\ income}$	Non-interest income Net interest income	Profit and loss statement

Bank size	Control	$LN\ (Total\ assets)$	Total assets	Balance sheet
Equity growth	Control	$EG = \frac{Equity\ of\ previous\ period - equity\ of\ present\ period}{Equity\ of\ previous\ period}$	Equity of present period Equity of previous period	Balance sheet
Loan growth	Control	**	Granted facilities and claims of previous period Granted facilities and claims of present period	Balance sheet

$$**LG = \frac{Granted\ facilities\ and\ claims\ of\ previous\ period - granted\ facilities\ and\ claims\ of\ present\ period}{Granted\ facilities\ and\ claims\ of\ previous\ period}$$

6. FINDINGS OF THE RESEARCH

1.3. Descriptive statistics of variables

The descriptive statistics of the observations are summarized in the table below:

Table 2. The descriptive statistics of the observations are summarized

Symbol	All Years: from 2009 to 2014			Pre-crisis:2009-2010			In-crisis:2011-2012			Post-crisis:2013-2014		
	mean	median	Standard error	mean	median	Standard error	mean	median	Standard error	mean	median	Standard error
ROA_t	0.0132	0.0092	0.0158	0.0172	0.0128	0.0172	0.0129	0.0086	0.0153	0.0096	0.0068	0.0141
NIM_t	0.0927	0.9980	0.0405	0.0959	0.0872	0.0463	0.0871	0.0899	0.0345	0.0951	0.0966	0.0404
$ERATIO$	0.4111	0.3973	0.2380	0.4178	0.4038	0.2405	0.3942	0.3558	0.2175	0.4215	0.3793	0.2602
EA	0.1011	0.1960	0.0827	0.1053	0.0587	0.1008	0.1033	0.0749	0.0761	0.0948	0.0754	0.0697
RCL	0.3019	0.9691	0.7495	0.2977	0.2158	0.3727	0.2137	0.2019	0.1236	0.3967	0.1532	1.2536
NPA	0.1113	0.1401	0.0596	0.1221	0.1163	0.0619	0.1140	0.1068	0.0549	0.0977	0.0852	0.0608
NCO	0.0666	0.3060	0.0377	0.0659	0.0599	0.0432	0.0683	0.0625	0.0348	0.0655	0.0584	0.0353
$NIIR$	0.1692	0.7041	0.1161	0.1518	0.1320	0.1048	0.1852	0.1522	0.1262	0.1707	0.1359	0.1168
LA	0.6199	0.8116	0.2418	0.6530	0.6430	0.3587	0.6140	0.6066	0.1229	0.5929	0.5895	0.1813
EG	0.6019	0.3631	2.3113	0.7337	0.1413	2.9106	0.4431	0.1539	1.1461	0.6297	0.1277	2.5530
LG	0.3685	0.8612	0.7953	0.5373	0.1831	1.2801	0.3122	0.2151	0.3801	0.2561	0.2537	0.3207

1.4. Inferential statistics

1.4.1. Testing the first hypothesis

The first hypothesis of the research is: "The relationship between the efficiency ratio and the profitability of the bank is affected by the crisis."

The results of testing the first hypothesis based on the dependent variable "Return on Assets and Net Interest Margin" are presented in Table 3:

Based on the dependent variable of return on assets, there is a significant and inverse relation between the ratio of efficiency and return on assets, given that the value of p is less than 0.1 and that its coefficient is negative. In the pre-crisis period, the coefficient is negative and the p-value is less than 0.1, so there is a reverse and significant relationship between the efficiency ratio and the return on asset. In period of crisis, p-value is less than 0.1 and its coefficient is negative, so in this period, the relationship between the two variables is inverse and significant. In the post-crisis period, there is an inverse relationship between the two factors with the level of error 0.1. Because p is less than 0.1 and the sign of coefficient is negative.

Table 3. The result of testing the first hypothesis for the dependent variable ROA and (NIM) and ROA

variable		period	coefficients	Standard error	The statistics t	*P*- value	result
ROA	*ERATIO*	The whole periods	-0.060	0.008	-6.986	<0.001	***
		Pre-crisis	-0.049	0.019	-2.591	0.017	*
		In-crisis	-0.074	0.018	-3.959	<0.001	***
		Post-crisis	-0.063	0.019	-3.256	0.004	**
NIM	*ERATIO*	The whole periods	-0.009	0.023	-0.424	0.672	-
		Pre-crisis	-0.011	0.035	-0.338	0.739	-
		In-crisis	-0.129	0.050	-2.568	0.018	*
		Post-crisis	0.061	0.058	1.048	0.309	-

According to the information presented in the table, we see that over the whole period and in the pre-crisis period, and in the post-crisis period, p-value is more than 0.1, therefore, there is no meaningful relationship between the efficiency ratio and the net interest margin in the above periods. In the period of crisis, the sign of the coefficient is negative and p-value is less than 0.1, so there is a reverse and meaningful relationship between the independent variable and the dependent variable. According to the above, it can be argued that the relationship between the crisis and the profitability of the bank is affected by the crisis due to the dependent variable of the net interest margin. Therefore, this hypothesis is confirmed in terms of the net interest margin. According to the explanation of the tables related to the two dependent variables: return on assets and return on equity, the crisis affects the relationship between the asset and profitability ratio in terms of the two mentioned variables. And yet its effect is even more visible on the net interest margin.

1.4.2. Testing the second hypothesis

The second hypothesis of the research is: "The relationship between the ratios of equity to assets with the profitability of the bank is affected by the crisis."

The results of testing the second hypothesis for the dependent variable "return on assets and net interest margin" are presented in Table 4.

According to Table 4, for the dependent variable ROA, due to the disappearance of the relationship between variables during the crisis period, this event can be attributed to the existence of a crisis. As can be seen, the crisis has eliminated the relationship between variables, and even after the crisis, this lack of communication has been preserved. According to the above description, the relationship between the independent variable EA and the dependent variable ROA is affected by the crisis. As a result, the second hypothesis is confirmed for the dependent variable of return on assets.

Table 4. The result of testing the second hypothesis for the dependent variable (NIM), ROA

The dependent variable	The independent variable	period	coefficients	Standard error	The statistics t	*P*-value	result
ROA	*EA*	The whole periods	-0.010	0.013	-0.817	0.414	-
		Pre-crisis	-0.049	0.022	-2.182	0.041	*
		In-crisis	-0.019	0.023	-0.795	0.435	-
		Post-crisis	0.012	0.023	0.535	0.599	-
NIM	*EA*	The whole periods	0.017	0.042	0.419	0.676	-
		Pre-crisis	-0.034	0.048	-0.711	0.485	-
		In-crisis	-0.205	0.068	-2.977	0.007	**
		Post-crisis	-0.042	0.069	-0.616	0.546	-

Also, in terms of the dependent variable of the net interest margin (NIM), p-value in all periods and periods of pre- and post- crisis, is more than 0.1, so there is no significant relationship in the aforementioned periods between the net interest margin and the equity ratio. In the period of crisis p- value is less than 0.1 and the sign of the coefficient is negative. As a result, there is a reverse and meaningful relationship between EA and NIM during the crisis. Therefore, it can be concluded that the relation between the equity ratio and the bank's profitability is only affected by the crisis for the dependent variable of the net interest margin. As a result, the second hypothesis is confirmed for the NIM variable.

1.4.3. Testing the third hypothesis

The third hypothesis of the research is: "The relationship between the reserve ratio for credit losses and the profitability of the bank is affected by the crisis."

The results of analyzing the hypothesis for the dependent variable "Return on Assets and Net Interest Margin" are presented in Table 5. The table shows that in the pre- and post- crisis periods and in the period of crisis, p-value is more than 0.1, so there is no meaningful relationship between these variables in the aforementioned periods. In the whole periods, P-value is less than 0.1 and the coefficient sign is positive. As a result, there is a direct and meaningful relationship between the reserve ratio for credit losses and return on assets in all periods.

Table 5. The result of testing the third hypothesis for the dependent variable (NIM)

The dependent variable	The independent variable	period	coefficients	Standard error	The statistics t	*P*-value	result
ROA	*RCL*	The whole periods	0.004	0.0017	2.730	0.006	**
		Pre-crisis	0.004	0.0049	0.928	0.364	-
		In-crisis	-0.005	0.0147	-0.402	0.692	-
		Post-crisis	0.002	0.0042	0.600	0.556	-
NIM	*RCL*	The whole periods	0.009	0.004	2.050	0.043	*
		Pre-crisis	0.022	0.009	2.375	0.027	*
		In-crisis	0.074	0.036	2.040	0.054	-
		Post-crisis	-0.003	0.010	-0.030	0.976	-

Also, regarding the net interest margin variable, in the whole periods and in the pre-crisis period as well as during the crisis, p-value is less than 0.1 and the coefficient sign is positive. As a result, independent and dependent variables have a direct and meaningful relationship at the 10% error rate. But as shown in the table above, in the post-crisis period, P-value is more than 0.1, so there is no meaningful relationship between the above two variables. As can be seen, during the crisis period, the coefficient is increasing and the relationship between variables has shrunk. In fact, this itself reveals somehow the impact of the crisis. Therefore, the third hypothesis of the research is confirmed for the dependent variable of the net interest margin.

1.4.4. Testing the fourth hypothesis

The fourth hypothesis of the research is: "The relationship between non-operating assets and the profitability of the bank is affected by the crisis."

The results of the above hypothesis test for the dependent variable "Return on Assets and Net Interest Margin" are presented in Table 6. As can be seen from the table above, it can be deduced that for all periods and during the crisis because p-value is less than 0.1 and its sign is negative, there is an inverse and significant relationship between non-operational assets and return on assets. Also, there is no meaningful relationship between the two variables in the two pre- and post- crisis periods, because p-value is more than 10%. So, we can state that our fourth hypothesis is confirmed in terms of the dependent variable, return on assets, because the conditions are the same in the two periods of pre- and post- crisis. This means that the relationship between non-operating assets and bank profitability (return on assets) is affected by the crisis.

Table 6. The results of testing the fourth hypothesis for the dependent variable (NIM) and ROA

The dependent variable	The independent variable	period	coefficients	Standard error	The statistics t	*P*- value	result
ROA	*NPA*	The whole periods	-0.041	0.016	-2.586	0.009	**
		Pre-crisis	-0.009	0.040	-0.240	0.812	-
		In-crisis	-0.095	0.033	-2.878	0.009	**
		Post-crisis	-0.035	0.031	-1.123	0.277	-
NIM	*NPA*	The whole periods	-0.031	0.045	-0.677	0.500	-
		Pre-crisis	0.019	0.076	0.253	0.803	-
		In-crisis	-0.105	0.079	-1.319	0.201	-
		Post-crisis	-0.160	0.093	-1.721	0.103	-

According to the above table for the dependent variable of net interest margin, the results show that there is no meaningful relation between the independent variable NPA and the dependent variable NIM in any of the periods. It is because in the whole periods, as well as in each period separately, p-value is more than 0.1%. As a result, the fourth hypothesis is rejected for the independent variable of the net interest margin. This means that the relationship between non-operational assets and the bank's profitability (margin of net interest) is not affected by the crisis.

1.4.5. Testing the fifth hypothesis

The fifth hypothesis of the study is: "The relationship between net costs and profitability of the bank is affected by the crisis."

The results of testing the above hypothesis for the dependent variable "Return on Assets and Net Interest Margin" are presented in Table 7. In all periods, p- value is less than 0.1 and the variable coefficient is negative. Therefore, the relationship between variables of net costs and return on assets is inverse and significant. In the pre-crisis period, p-value is more than 0.1, so there is no relationship between the variables. In the period of crisis, p-value is less than 0.1 and the coefficient is negative, so the relation between the above variables is inverse and meaningful. In the post-crisis period at the error level of 10%, the relation between the variables is meaningful and in the opposite direction.

Table 7. The result of testing the fifth hypothesis for the dependent variable ROA and (NIM)

The dependent variable	The independent variable	period	coefficients	Standard error	The statistics t	*P*- value	result
ROA	*NCO*	The whole periods	-0.127	0.034	-3.720	<0.001	***
		Pre-crisis	-0.028	0.071	-0.393	0.698	-
		In-crisis	-0.304	0.796	-3.825	0.001	**
		Post-crisis	-0.180	0.081	-2.210	0.041	*
NIM	*NCO*	The whole periods	0.242	0.097	2.489	0.015	*
		Pre-crisis	0.073	0.121	0.604	0.552	-
		In-crisis	-0.437	0.181	-2.415	0.025	*
		Post-crisis	0.384	0.221	1.741	0.099	-

The review of Table 7 is that in all periods, p-value is less than 0.1 and the sign of coefficient is positive, so there is a direct and meaningful relationship between net costs and margin of net interest. In the pre-crisis period, p-value is more than 0.1; therefore, there is no meaningful relationship between variables. In the post-crisis period, there is a direct and meaningful relationship between the variables at the error level of 10%, since p-value is less than 0.1 and the sign is positive. There is also an inverse and significant relationship between the variables during the crisis period at the level of 10% error.

1.4.6. Testing the sixth hypothesis

The sixth hypothesis of the research is: "The relationship between ratio of non-interest income to revenue and the profitability of the bank is affected by the crisis."

The results of the aforementioned hypothesis study for the dependent variable "return on assets" are presented in Table 8. As it is evident, there is no meaningful relationship in the whole periods and in the pre- and post-crisis periods at the level of 10% error between the ratio of non-interest income to revenue and return on assets, since p-value is more than 0.1. But in the crisis period, p- value is less than 0.1 and the sign of the coefficient is positive. Therefore, in the period of crisis between the mentioned variables, there is a direct and meaningful relationship. The sixth hypothesis of the research is true for the variables of NIIR and ROA. As a result, the sixth hypothesis is confirmed in terms of the dependent variable of return on assets.

Table 8. The result of testing the sixth hypothesis for the dependent variable (NIM)

The dependent variable	The independent variable	period	coefficients	Standard error	The statistics t	*P*- value	result
ROA	*NIIR*	The whole periods	0.006	0.008	0.434	0.782	-
		Pre-crisis	0.009	0.030	0.314	0.756	-
		In-crisis	0.019	0.010	1.859	0.077	-
		Post-crisis	-0.008	0.013	-0.596	0.558	-
NIM	*NIIR*	The whole periods	-0.102	0024	-4.238	<0.001	***
		Pre-crisis	-0.058	0.061	-0.946	0.355	-
		In-crisis	-0.044	0.029	-1.551	0.136	-
		Post-crisis	-0.023	0.040	-0.568	0.577	-

As can be seen, in all periods, p-value is less than 0.1 and the sign of the coefficient is negative; therefore, there is a reverse relationship between the ratio of non-interest income to revenue and the margin of net interest, that is, by decreasing one of them, the other one increases and vice versa. In pre-, in-, and post- crisis periods, there is no meaningful relationship between these variables, since p-value is more than 0.1. So, we can say that the sixth hypothesis is rejected from the perspective of the dependent variable of the net interest margin, that is, the relation between the ratio of non-interest income to revenue and the profitability of the bank (net interest margin) is not affected by the crisis.

7. DISCUSSION AND CONCLUSION

In this study, we examined the factors affecting the bank's profitability including the type of bank, the type of industry and macroeconomic variables in the three pre- and post-crisis periods as well as during the financial crisis of 2011 and 2012 years. To understand more, this research is the first attempt to compare the factors affecting bank profitability in the three periods mentioned. In our descriptive statistics, we saw a decline in bank profitability and a decline in lending activities right in and after the crisis. The event is in line with evidence that the recession caused by the financial crisis is more severe than the recession caused by short-term fluctuations in the business cycle. Indeed, banks respond to the crisis by increasing their capital and liquidity levels. That is, increasing capital and liquidity will enable banks to absorb and improve future losses. Banks have slowed the growth of the loan in the post- crisis period. The incident is accompanied by reports of higher costs from higher losses related to external assets and credit constraints on borrowers during the crisis. These findings indicate that costs are passed on to customers during the two periods of in- and post- crisis.

This issue can be linked to loan problems that lenders have faced during the crisis, and is in fact a normal behavior by the bank that is not beneficial for improving economic conditions. Increasing non-interest income indicates that banks have not responded to the crisis by lowering their business benchmark (which has it that be conservative and traditional). (Llewellyn, 2013). This is contrary to the findings that the interest in addition to income (a representative for non-traditional activities) has a reverse relationship with the profitability during the crisis period. In this study, we did not see any relationship between bank size (asset log) and profitability at any of the aforementioned periods. This is in contradiction to the previous research that claims that the relationships between profitability determinants

are adjusted based on profitability criteria and the economic conditions of the study period. It is said that the relationship between profitability and determinants varies based on the income level of the studied country. Understanding the complex interaction between factors associated with bank profitability in the future will also challenge academic researchers and bank managers and legislators.

8. SUGGESTIONS FOR FUTURE RESEARCHES

1. In future research, it's best to focus on the industry in terms of the assets amount of the bank, the bank's capital, and the number of deposits, and its relevance to the performance or profitability of the bank.
2. It is suggested that in future research, other variables such as bank value (Q Tobin), efficiency and effectiveness, and other performance criteria should be used instead of the dependent variable of this study (profitability).
3. It is suggested that future research should provide a model for assessing the interaction between risk and competition on the bank's profitability.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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