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How to determine the profitability of the bank during and before the international financial crisis (Case study: accepted banks in Tehran Stock Exchange)

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Abstract: In economy of any country especially in activities of financial support and different market sectors, banks act as the mastermind. In this regard, the profitable banks can help in stabilize financial sector in a country. The effective factors on banks profitability during the financial crisis are such favorite's cases for bank managers, government authorities and university researchers which attract more attentions and they still remain as a key issue in financial literature. In this research, it has been dealt with the study of the effect of how to determine the profitability during and before international financial crisis in accepted banks in Tehran Stock Exchange during the years 2001 to 2012 based on data panel with fix effect. The results of this research show that capital adequacy, liquidity, bank size, the growth rate of deposits has positive and significant effect on bank profitability. Financial crisis and concentration cause to decrease the bank profitability and the effect of macroeconomic variables on bank profitability indicates the negative effect of inflation rate and positive effect of growth of Gross Domestic Production on bank profitability.

Key words: Bank profitability; International financial crisis; Tehran Stock Exchange

1. Introduction

Banks make money by offering banking services to their clients that this way is happened by attracting people deposits with higher profits and the result of the difference between two rates is called bank earning and it is called interest margin. Therefore, whatever bank can use economic index, the profit of this action will increase. Profit considers the important information in economic decisions. The studies and researches has been done about profit constitute one of the most voluminous and most research efforts in the history of accounting forms. Profit as dividend profit guide has been used by investors, managers and financial analyzers as a tool of assessing management effectiveness and prediction device and evaluation of making decisions (Thaghafi, 1994). One of the basic requirements and prerequisites for inclusion in the development is providing and allocating the capital and financial resources in optimal way that the role of financial institutions become important in a way that equipment, supplies and gathering capital and financial resources in one hand and on the other hand, it is effective in allocation and optimal distribution of that. In this regard, banks have sensitive and important role in economy of our country. In fact, banks are the oldest and most active and largest financial intermediaries that are responsible the undeniable role in collecting and distributing the optimal financial resources. Different requirements of developed societies or developing societies and also government intervention in money market to achieve the objectives including development objectives has led that banks evolved over time and they are organized in various frameworks that including these divisions, we can mention to development banks, commercial, and special that each of them has created and developed based on requirements of different communities as public and private (Hamedi & Awdeh, 2012). In economy of any country especially in activities of financial support and different market sectors, banks act as the mastermind. In this regard, the profitable banks can help in stabilize financial sector in a country. The effective factors on banks profitability during the financial crisis are such favorite's cases for bank managers, government authorities and university researchers which attract more attentions and they still remain as a key issue in financial literature.

2. Theoretical framework

Lee and Hsieh (2013) have concluded that the obtain literature in this tem shows the ambiguous effects of the banking capital on banking profitability. In this regard, they dealt to study this issue with using of data from 2276 banks for 42 Asian countries during the years 1994 to 2008. They showed that investment banks have less effect of banking capital on banking profitability that the way of their effect is positive. Also, available banks in the countries with low income have maximum effect of banking capital on banking profitability. Ditrich & Wanzenrid (2011) did not find any relationship

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between equity as an index for capital adequacy and banking profitability, for instance when they have used from the ROAE variable as an index, the coefficient related to that has been negative, however, it was not significant in terms of statistic and when they have used from NIM variable as an index, the coefficient of this variable has been positive which were also not significant in terms of statistic. Other studies such as: Kant and Hoozinga (1999), Herero et al (2009), Lee et al(2010) and Saminto and Yasoosi (2011) have concluded that banks have best performance which have high level of equity to compare with other their assets, because they can be less concerned about future bankruptcy costs due to the lower costs of financial supply.

In addition, there is also empirical evidence which shows that the liquidity has been measured by all loans on all assets has positive effect on banks profitability (Abreu and Mendes, 2002) and it has negative effect on banking profitability has been measured by ROE, ROA, NIM indexes (Lio et al, 2010). In addition, there is also another experimental evidence which shows that the liquidity has been measured by all loans on other determinates factors of bank profitability uses to measure the productivity level of operational efficiency. Atansooghloo et al (2008) and Goodrad et al (2009) show that there is a positive correlation exists between the income ratio on cost and bank profitability. In contrast, Ditrich and Vanzenvard (2011) have shown that there has been negative correlation among ROE and NIM and operational productivity for banks of Switzerland during the period of 1999 to 2006.

One of the variables related to the specific characteristics of a bank is bank size. Ditrich and Vanzenvard (2011), Pasiroos and Kasmido (2007) and Alper and Anbar (2011) have observed that there is a positive and significant relationship between bank size and banking profitability because big banks have more loans to compare with small or medium banks. Trujillo-Ponce (2013) mentioned that big banks can take advantage of economies of scale and thus they earn more interest. Miko et al (2007) also show that there is s positive but insignificant relationship among them.

3. Research model

The estimated model in this study is as form in below which performance variable with one lag is used as explanation variable.

$$PERF_{it} = \alpha + \eta PERF_{i,t-1} + \beta_1 CAP_{i,t-1} + \beta_2 LIQ_{it} + \beta_3 CIR_{it} + \beta_4 DEP_{it} + \beta_5 SIZE_{it} + \beta_6 OBS_{it} + \beta_7 HH_{it} + \beta_8 INF_{it} + \beta_9 GDP_{it} + \varepsilon_{it}$$

Dependent variable:

Performance (bank profitability index) (PERF): this study has used from ROA index (rate of return asset = net profit before tax deduction to total assets).

Independent variables:

Capital adequacy (CAP): shares more than the total assets (based on the Bazel agreement 2 related to capital adequacy, the banks of the country are required to keep at least 8 percent of their total capital in order to cover the risk of their assets).

Liquidity (LIQ): total given loans to clients on total assets

The ratio of costs to income (CIR): total costs to total gained income as operational productivity index

The rate of deposits growth (DEP): the rate of deposits growth of each bank in every year

Bank size (SIZE): the value of total assets of each bank

The year of international crisis is (2007-2010) that is identified as dummy variable.

Focus (HH): Herfindal-Hirschman index.

The index of bank market concentration (IMC):

Market concentration is one of the most important aspects of the banking market structure which can be considered as the most important effective structural variable on banks profitability. Researchers use from different indexes in their experimental works to measure the focus. In this research, the Herfindal-Hirschman concentration index is used which is calculated as below.

$$IMC_{it} = \left(\frac{\text{total deposits of bank i in year t}}{\text{total deposits of business banks in year t}}\right)^2$$

Macroeconomic factors include:

The rate of current inflation (INF), Gross Domestic Production (GDP)

4. The estimation of the model

In order to be able to determine whether using of panel data method in estimating intended model is efficient or not, we use of Limer F test and in order to determine which method (fix effect and or accidental effect) is more suitable for estimating (fix determination or random variation of the across), we use of Hasman test. The obtained results from these tests are presented in table 1.

Table 1: the results of Limer F test

Statistic	Probability	Accepted method
35.65	0.001	Panel data method

As it is obvious in Table 1, the results indicate the zero hypothesis rejection. As a result, panel data with fix effect is accepted. Therefore, for choosing between panel data method with fix effect and accidental effect method, the Hasman test is done. The results of this test are shown in Table 2.

As it is obvious in table 2, the results indicate the rejection of zero hypotheses. As a result, panel data method with fix effect is accepted. Finally, with regard to the results of Limer F test and Hasman test, the model of research is estimated with using of panel data with fix effect from equation 1.

Table 2: the results of Hasman test

Degree of Freedom	Chi-square statistic	Probability	The results of test
10	30.18	0.050	Fix effect

To assess the validity of the model and study of classic regression assumption, it is required to do some tests related to normality of the residuals, homogeneity of variances, and independency of the residuals and the absence of stipulated error model in addition to exploring the absence of multicollinearity between the independent variables in the model. The results are as table 3.

Table 3: the results of tests related to statistical assumptions of model (1)

Statistic Ramsey		Statisti Durbin-Watson	Statistic Reusch-Pagan		Statisti Jarque-Bera	
$P-Value$	F	$D\text{-}W$	$P-Value$	F	$P-Value$	χ^2
0.5231	0.2431	1.92	0.0015	32.352	0.5234	1.4523

According to the obtained results from F Limer test and Hasman test and also the results of classic regression assumption test, model (1) of the research has been estimated with using of panel data method and as fixed effects. The results of model estimation are presented in table 4.

Table 4: the results of research first assumption test with the use of fixed effect method

Variable	Coefficient	Probability
Intercept	-19.007	0.022
Capital adequacy	1.1230	0.023
Liquidity	-2.9360	0.001
The ratio of costs to income	-0.6367	0.002
Deposits growth rate	0.0143	0.005
Bank size	1.1230	0.025
Virtual international financial crisis	-0.2130	0.080
Concentration	0.0126	0.004
Current inflation rate	-0.2142	0.005
Annual GDP growth	0.4254	0.001
determination coefficient:	0.46	
adjusted determination coefficient:	0.45	

5. Conclusion

The results show that the effect of virtual independent international financial crisis variable (2007-2010) that is identified as virtual variable has had negative and significant effect on bank profitability index; however, it is significant at 10 percent level. The main reason for this situation can be said Iran Stock is distinct from international Stock, but this is not necessarily reflecting the effects of the global financial crisis. The reasons for this effect can be expressed that with spreading the global financial crisis to the real economy and falling oil prices and or many of petroleum products and falling exports of many banks, all have been effective sources on production and profitability of the banks in Tehran Stock. Also, results show that independent capital equity variable has had positive and significant effect on Stock banks profitability index and it indicates that profitability index has been increased due to decrease in risk of companies' assets. In fact, capital equity of shares is more than total assets which the country banks are required to keep at least 8 percent of total assets in order to cover risk based on Bazel 2 agreement related to capital equity and this issue has positive effect on banks profitability. Also, results show that independent liquidity variable has had negative and significant effect on Stock banks profitability index and this indicates that with increase in the research independent variable, profitability index reduces due to increase in liquidity risk. In fact, whatever total given loan to total assets increased, bank will approach to its border point of liquidity risk which finally can reduce the profitability. Also, the results show that the independent variable of costs to income (CIR) has had negative and significant effect on Stock banks profitability index and this indicates that with increase the research independent variable, the profitability index reduces due to decrease in income and increase in costs. In fact, with increase the total costs to total gained income as operational productivity index, the profitability indexes will be decreased. Also, the results show that the effect of deposits growth rate variable (DEP) has had positive and significant effect on Stock banks profitability index and this indicates that with increase the research independent variable, the profitability index has been increased due to decrease the risk of companies' assets. In fact, with increase the deposits growth rate of any banks in any year, the risk of bank is decreased and income can increase which finally leads to increase in bank profitability. Also the results show that independent bank size variable (SIZE) has had positive and significant effect on Stock bank profitability index and this indicates that with increase the research independent variable, profitability index in increased due to decrease the risk and increase the companies' credit. In fact, with increase the value of total asset of any bank, credit and the view of investors to bank will be increased which finally leads to increase the bank profitability. Also, the results show that the effect of independent balance sheet variable (OBS) has had positive and significant effect on Stock banks profitability and this indicates that with increase the research independent variable, profitability index increased due to increase in companies' income. In fact, with increase in non-interest income to total assets, total income can be increased which finally leads to increase the bank profitability. Also, the results show that the effect of independent year concentration variable (HH) has had the negative and significant effect on Stock banks profitability index and this indicates that with increase in research independent variable, profitability index is decreased due to decrease in competitiveness and increase in the banks' monopoly. In fact, with increase in Herfindal Herishman index, monopoly among banks will increase and this increase often will belong to some banks which inappropriate distribution of this profit can cause the decrease in productivity and income and profitability. In fact, we can say that market concentration is one of the important aspects of banking market structure that maybe consider as the most important effective structural variable on banks profitability. Also results show that the effect of independent variable of macroeconomic factors of the current inflation rate (INF) has had negative and significant effect on Stock banks profitability and this indicates that with increase in research independent variable, profitability index is decreased due to increase the costs. In fact, inflation is one of the most important variables of macroeconomic that although, it can increase the bank profitability, but it can decrease the bank profitability in many ways such as: decrease the deposits due to the presence of hot money, increase the banks' costs and instability in deposits and etc. Also, results show that the effect of independent variable of macroeconomic of yearly growth of Gross Domestic Production (GDP) has had positive and significant effect on Stock banks profitability index and this indicates that with increase the research independent variable, profitability index is increased due to prosperity. In fact, yearly growth of Gross Domestic Production (GDP) is one of the most important variables in macroeconomic which can affect the bank profitability. Therefore, with regard to the effect of financial crisis variable on profitability, it is advised to all banks to pay attention to global financial situation and determine global financial crisis to be able to deal with it or manage it.

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