

Degree of Leverage Ratio Analysis in the Iranian Banking Network

Valipour Pasha, Mohammad⁻
and Arshadi, Ali⁻

Received: 12/15/2015 Approved: 6/7/2016

Abstract

The banking response to the 2008 financial crisis was analyzed and evaluated in this paper. This reaction can be interpreted as if the coefficient of total debts to equity (lev1) and total assets to equity (lev2) are positive as anticipated in the banking network of Iran. The paper uses data from 31 Iranian banks' annual databases during the course of 2006-13 in order to estimate an optimal balance sheet adjustment. We identify the leverage ratio degree to show that both equity and liabilities tend to adjust to move leverage positively without considering the state of the Iranian economy. On the other hand, the index of leverage coefficient conditioned by the state of the economy is negative which replicates that banks tend to experience a negative impact of leverage on the return to equity as a result of cost push due to higher ratio of assets to equity in the bust and inappropriate return on investment. Furthermore, the non-performing loans ratio coefficient is negative and significant which proves that one percent increase in the nonperforming loans has led to a less than one percent decrease in the return on equity ratio as expected, but the total loans to total deposits ratio depicts a negative-significant coefficient which denotes the higher non-performing loans have caused that loans ratio increase will not necessarily give rise to higher returns for the banks. Besides, the leverage ratio (lev2) is positive as expected and banks gain higher returns through higher leverage. Overall, the leverage ratio's nonlinearity is added by the state of the economy (dummy) is negatively significant owing to cost push from lower return on investment and higher ratio of assets to equity in the bust.

Keywords: Profitability, Degree of leverage ratio, Economic boom and bust

JEL Classifications: C23, E32, E44, E51, G21, M20

⁻ Researcher, Monetary and Banking Research Institute. E-mail: pashaptl@gmail.com

⁻ Assistant Professor, Monetary and Banking Research Institute. E-mail: arshadi63@yahoo.com

1. Introduction

The build-up of excessive leverage in financial intermediaries was an underlying cause of the global financial crisis. In many cases, banks cranked up their leverage to perilous levels while maintaining risk-based capital ratios that, still looked solid to all outward appearance, (BCBS, 2014). The new regulatory framework of Basel III which has introduced a minimum leverage ratio, defined as a bank's Tier 1 capital over an exposure measure is independent of risk assessment to cure the vulnerability (Ingves, 2014). The aim of the leverage ratio is to act as a complement and a backstop to risk-based capital requirements. It should counterbalance the build-up of systemic risk by limiting the effects of risk weight compression during booms (Borio and Zhu, 2012, Adrian and Shin, 2013, Vallascas and Hagedorff, 2013, Altunbas, Gambacorta and Marques-Ibanez, 2014). In good times, better economic conditions increase the number of profitable projects in terms of expected net present value and hence increase the demand for credit [Kashyap, Stein and Wilcox (1993)]. The increase in the supply of lending and other investments will be reflected in an expansion of banks' exposure measures (independent of how these risks may be estimated by regulators or the banks themselves) and, therefore, in a reduction of the leverage ratio. This will make the regulatory minimum a tighter constraint: Banks with limited capital will be forced either to increase their capital base or to reduce their activities. The leverage ratio is therefore expected to act counter-cyclically, being tighter in booms and looser in busts. In other words, we should observe that the leverage ratio is negatively correlated with GDP or credit growth (Brei and Gambacorta, 2014). The Basel III framework requires that the leverage ratio and the more complex risk-based requirements work together. The leverage ratio indicates the maximum loss that can be absorbed by equity, while the risk-based requirement refers to a bank capacity to absorb potential losses. The use of a leverage ratio is not new. A similar measure has been in force in Canada and the United States since early 1980s (Crawford et al., 2009, D'Hulster, 2009). Canada introduced its leverage ratio in 1982 after a period of rapid leveraging up by its banks, and tightened the requirements in 1991. In the United States, the leverage ratio was introduced in 1981 amid concerns over bank safety due to falling bank capitalization and a number of bank failures (Wall and Peterson, 1987, and Wall, 1989).

Leverage allows a financial institution to increase the potential gains or losses on a position or investment beyond what would be possible through a

direct investment of its own funds. There are three types of leverage-balance sheet, economic, and embedded - and no single measure can capture all three dimensions simultaneously. The first definition is based on balance sheet concepts, the second on market-dependent future cash flows, and the third on market risk. Balance sheet leverage is the most visible and widely recognized form. Whenever an entity's assets exceed its equity base, its balance sheet is said to be leveraged. Banks typically engage in leverage by borrowing to acquire more assets, with the aim of increasing their return on equity. Banks face economic leverage when they are exposed to a change in the value of a position by more than the amount they paid for it.

A typical example is a loan guarantee that does not show up on the bank's balance sheet even though it involves a contingent commitment that may materialize in the future. Embedded leverage refers to a position with an exposure larger than the underlying market factor, such as when an institution holds a security or exposure that is itself leveraged. A simple example is a minority investment held by a bank in an equity fund that is itself funded by loans. Embedded leverage is extremely difficult to measure, whether in an individual institution or in the financial system. Most structured credit products have high levels of embedded leverage, resulting in an overall exposure to loss that is a multiple of a direct investment in the underlying portfolio. Two-layer securitizations or securitizations, such as in the case of a collateralized debt obligation that invests in asset-backed securities, can boost embedded leverage to even higher levels. The standard measure of leverage is total liabilities to equity and total assets to equity. However, while some liabilities-like bank loans and bonds issued-are due to financing, other liabilities-like trade payables, deferred revenues, and pension liabilities-result from transactions with suppliers, customers and employees in conducting operations. Financing liabilities are typically traded in well-functioning capital markets where issuers are price takers. In contrast, firms are able to add value in operations because operations involve trading in input and output markets that are less perfect than capital markets. So, with equity valuation in mind, there are a priori reason for viewing operating liabilities differently from liabilities that arise in financing (D'Hulster, 2009).

Profitability determinants are more often evaluated by most countries who have underscored to take hold of a bank-based financial network. However, it requires adequate studies about risk and return of the banks to know them appropriately in Iran. Among the seventeen commercial banks which are

active in the country, eleven are state-owned whereas other six banks are privately governed. Like all the financial intermediaries procedure, the Iranian banks follow a conventional path of absorbing deposits for lending with a spread on loans in order to make profit. In Iran, all the banks must follow Islamic banking principles where profit rates are set on deposits and expected rates of profit on facilities are set on loans. Iranian banks were nationalized and banking regulations changed with the approval of the Islamic Banking Law (interest free) in 1983, and the role of banks in accelerating trade deals, rendering services to clients, collecting deposits, offering credits to applicants on the basis of the CBI's policies and so on was strengthened (Salehi and Alipour, 2010).

Following the reforms in the financial sector, government control removal, and investment motivations, Iranian banks perceived remarkable variations. Central bank was led by the government to have ups and downs with the public banks governance and utilize specific monetary policies in lieu of their objectives and fiscal policy (Gharaie Ahangar, 2009). Money supply is controlled by the central bank after it had challenges with the mixture of private and state-owned banks owing to performance and productivity to cope with public intervention in financial intermediaries (Dehghan Nejad, 2010). The number of private banks in Iran is far lower than the international standards which is due to the lack of completion in the financial system (Naghshineh Pour, 2009).

Policy makers have carefully noticed the return factors and researchers have generally pinpointed it since higher return in banks' financial situations is accompanied by augmented risk that is an index for evaluating financial stability as well as national economy. What caused intense attention to the performance implications is the banking crisis which has led to an interest to both regulatory and supervisory authorities and banks' stakeholders (Roman and Danuletiu, 2013).

Financial system in Iran is focused on banks and financial and credit institutions, which have a crucial role in financing the real economy and ensuring the financial stability. Therefore, guaranteeing a stable and highly effective banking sector is of major importance to deal with economic growth and financial stability.

Following a high generated loans, especially to households, a diversity of banking operations, a range of banking products and services, the banks have recorded a growing income, with positive and significant impact upon the

profitability indicators. In the whole period, during which the current world economic met crisis, significant structural, institutional and legislative transformations caused Iranian banking sector to register a rapid growth upon bank profitability and efficiency.

By using balance sheets of Iran's banking system, the objective of our research is to measure the leverage ratio degree relating to the banks' profitability in the Iranian banking network in this framework.

This study patronizes an imbalanced data model for 31 Iranian banks during the course of 2006-13 where the impact of leverage ratio on banks profitability known as the degree of leverage ratio is evaluated and leverage ratio is defined as the ratio of total assets on equity in line with a dummy of leverage and GDP growth multiplication to consider the economic situation in line with the influence that leverage might have on the banks' return. The paper proceeds as follows: Section Two focuses on literature review; Section Three briefly describes profitability and asset/liability variations to take a look at the facts of the banking network, Section Four reflects the methodology, data and model; Section Five underscores the empirical results of our investigation, and Section Six reflects the conclusions.

2. Literature Review

Financing structure refers to all types of funding sources used in financing the project total assets, so it is different from capital structure, which is represented by institution permanent funding elements, which includes equity and long-term loans. Therefore, project capital structure is a part of its funding structure (Yahyaoui, 2002). There are various types of available funding sources for businesses organizations that take several classifications vary from one writer to another according to classification target. There are those who depend on ownership criterion and thus differentiate between private funds and debts. And those who divide these sources to traditional and modern, according to their appearance, taking into account recent trends regarding traditional securities (Mohammed, 2010). Financial managers seek to achieve ideal capital structure for the project through the use of appropriate funding combination that leads to reduce financing cost to its minimal limit and increase shares market value (Akintoye & Taylor, 1998). In contrast, financing funds concentration in a single source, which is owners' money, leads to in appropriate capital structure. The inappropriate capital structure is

deemed inappropriate when it does not affect the project mark value (Singhania and Seth, 2010).

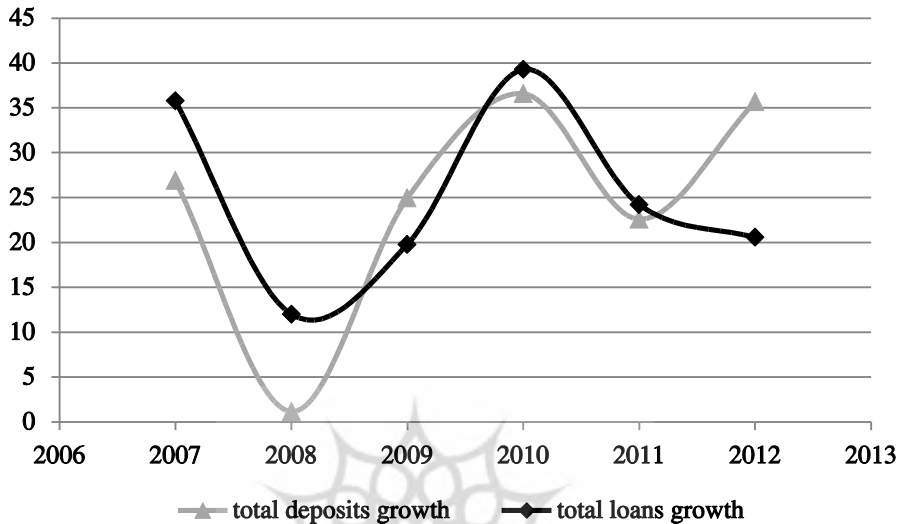
There are several factors that affect the formation of funding structure within a project. Some are internal based on the use of a combination of funding which includes external debt and common and preferred shares, according to these projects needs' of funding in addition to the quality of available investment opportunities to these projects. This is made through an exchange policy between risk and return and to conduct in-depth studies and for project financing and financing available investment alternative needs in addition to study cost of each alternative funding in addition to study operational risk and management acceptance degree of risks surrounding and tax impact and the extent of tax benefits for alternative funding to another, as well as taking into account the flexible financing structure, on the other hand, there are external factors that affect financing structure and include lenders sensitivity to company high indebtedness of, and industry nature in which it operates in terms of competitiveness, growth and stability of sales and profits, and assets value (Shlash, et al., 2008). All of these factors must be taken into account when designing project ideal financing structure, but practical status often differs, since actual and applied financing structure differs from ideal funding structure which management is trying to reach because of economic conditions, political and social variables the project has and therefore, the weighted cost of funding sources are not in their minimal limits (Deiranieh, 1992). The concept and importance of financial leverage and financing structure theories, financial leverage refers to use third party funds in financing in order to increase operating profit and taxes, which is loans ratio to total liabilities (Hawari, 1996) and financial leverage degree measures company's exposure level to financial risk, and it also reflects the change degree in earnings per share of operating profits resulting from earnings operating rate change before interests, and it is also defined that the use of others funds, (Akintoye & Taylor, 1998) and taxes to achieve additional profits that benefited the company's owners, so it depends on borrowing to finance company's operations in order to achieve a return that increases owners' profits. The financial leverage degree is increased by increasing use of external financing sources, and financial leverage can be increased by non-traditional financial instruments, such as the use of financial options and futures contracts (Fahmi, 2008). some consider financial leverage as one if the terms invented by institutional mental for packaging undesired or negative things or to give a nice appearance, instead of saying borrowing or

indebtedness which is a term that inspires risk and weakness we say financial leverage term that inspires confidence and strength (Nibal and Qasaba, 2010). In general, the company needs of short-term financing depends on sales growth rate in addition to company's efficiency and effectiveness degree in managing company's working capital, and on long-run short term financing needs may to long-term financing, so management of any Project should made periodical evaluation for financing structure and determine the extent dependence on debt funds in financing.

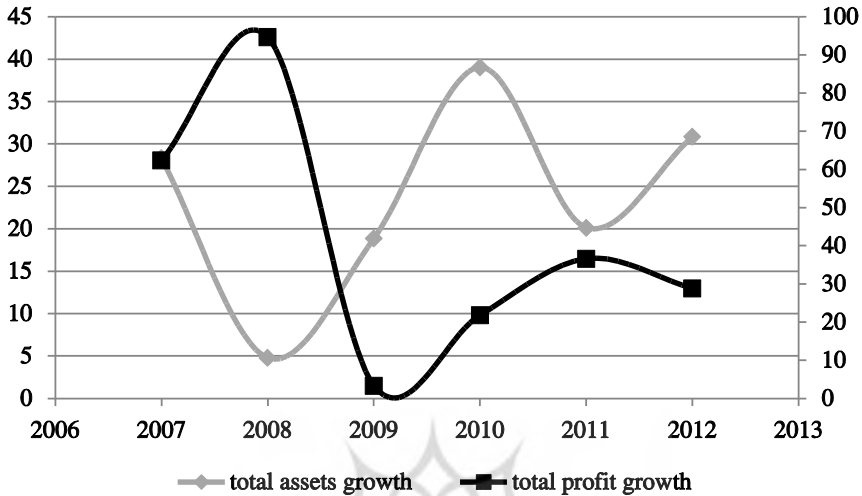
The risk of failure may rocket when banks do not adjust their equity in line with changes in their assets and liabilities. The condition deteriorates when boom and bust are considered in the study because when one percent increase leverage ratio will result in more than one percent profitability in boom, which could be regarded as justified since banks follow their conventional path in financial intermediaries where they make portfolio of assets in order to make profit. However, if in case a percent increase in the leverage ratio occurs, banks confront with a more than one percent decrease in profitability in bust which would be hazardous since it would cause difficulty in responding the deposits they have raised from the depositors and paid capital from the shareholders. Leverage ratio degree is measured as an innovation in this paper for the Iranian banks to obviously indicate whether banks are taking adventurous risk of increasing their costs for lower profits in the bust.

3. Profitability and Asset/Liability Variations

The ratio of total assets to equity and total deposits to equity are considered as major leverage definitions. According to Figure 1, loans and deposits growth rate of total banks in Iran have co-movement since 2007 with a sharp diminishing rate up until 2008 but they have increased sharply from 2008 to the peak of their growth rate of approximately 40 percent owing to positive expectations of the economic agents about the economy. However, these key banking variables commences on dipping from 2010 to 2011 where their co-movement breaks since the deposits growth rate starts to boom contrary to the growth of loans.

Figure 1: Loans, and Deposits Growth of Total Banks

On the other hand, profitability of the total banks in line with the assets growth rate of the banks are illustrated in Figure 2, where banks recorded the highest profitability in 2007 by almost forty percent growth rate contrary to the year 2009 when they registered the lowest return growth although it continues to gradually increase in the next years. Unfortunately, according to Figure 1 and 2 the deposits growth rate was increasing sharply in 2011-12 whereas the profitability is decreasing which shows that banks were raising money through deposits without taking their profitability into account during the bust in 2011-12 which appears to be hazardous for the banking network because banks are increasing their risk appetite and neglect how they must pay back their depositors' money.

Figure 2: Profitability and Assets Growth of Total Banks

Henceforth, in periods 2011-2012 when macroeconomic atmosphere started to confront with bust, banks pursue a risk taking approach and make their situations worsened by changing their assets portfolio from loans (which is decreasing) to investment and other assets portfolio items of their balance sheet which would absolutely-negatively influence their profitability.

4. Methodology, Data and Model

Imbalanced panel data model is patronized to study the behavior of banks from leverage ratio degree aspect which is literally defined as the percent increase in the profitability measure due to one percent increase in the leverage ratio utilizing 31 banks during 2006-13. The general linear regression model is provided in equation (1) as it follows:

$$Y_{it} = C + \beta_i X_{it} + \varepsilon_{it} \quad (1)$$

where: Y_{it} = dependent variable observed for i^{th} bank at time t ; X represents independent variables including financial soundness ratios and macroeconomic variables; β is the coefficient for explanatory variables; $i = 2 \dots N$; c is a constant term; ε is error term of the model. Commencing on

the general model and considering the selected variables, the empirical model is optimally selected as random effect based on the Hausman test used in this study which is presented by equation (2):

$$\text{LROE}_{it} = C + \beta_1 \text{LNPLTTL}_{it} + \beta_2 \text{LNPLTTA}_{it} + \beta_3 \text{LNPLTTE}_{it} + \beta_4 \text{LNPTEA}_{it} + \beta_5 \text{LROA}_{it} + \beta_6 \text{LTLTTD}_{it} + \beta_7 \text{LLATTD}_{it} + \beta_8 \text{LLEV2}_{it} + \beta_9 \text{GDP_G}_{it} + \beta_{10} \text{LLEV2D_GDP_G}_{it} \quad (2)$$

where the key determinants of return on equity as profitability or earning indicator is defined as the logarithm of return on equity (LROE), asset quality measures are denoted by LNPLTTL, LNPLTTA and LNPLTTE respectively representing logarithm of nonperforming loans to total loans ratio, logarithm of nonperforming loans to total assets proportion and logarithm of nonperforming loan to equity ratio, LNPTEA which indicates the logarithm of net profit to earning assets ratio signifying profit margine (PMAR) as another earning indicator in line with LROA defined as logarithm of return on assets, LTLTTD is defined as the logarithm of the total loans to total deposits ratio signifying the management indicator, LLATTD is determined by logarithm of liquid assets to total deposits ratio representing as the liquidity measure of the FSIs, LLEV2 is defined as the logarithm of leverage ratio (total assets to equity), GDP_G is representing gross domestic products growth of the Iranian economy, and LLEV2D_GDP_G denotes a dummy which shows the cross multiplication of the leverage ratio and GDP growth to depict the simultaneous impact of leverage during boom and bust in zero (bust) and one (boom) format to show that the leverage ratio is analyzed conditioned by the economic cycle.

In order to specify whether or not the variables are stationary, the Fisher-type unit root test for variables are patronized based on the Augmented Dickey-Fuller tests. Unit root test results depicted in table 1 illuminate that the explanatory variables are stationary at 1 percent as well as the variable of outcome of interest LROE except for the leverage ratio which is significant at 5 percent.

Table 1: Unit Root Test

Variables	Statistics	Prob.
LROE	190.11 ^{***}	0.0000
LNPLTTL	95.6 ^{***}	0.0001
LNPLTTA	142.43 ^{***}	0.0000
LNPLTE	182.97 ^{***}	0.0000
LNPTEA	74.67 ^{***}	0.0004
LROA	161.69 ^{***}	0.0000
LTLTTD	144.43 ^{***}	0.0000
LLATDD	157.71 ^{***}	0.0000
LLEV2	77.96 ^{**}	0.0400
GDP_G	329.38 ^{***}	0.0000

Source: Authors' Calculations

Note: The significant parameters are indicated as such with ***, **, * indicate Significance at 1%, 5% and 10% levels.

5. Empirical Results

Evaluating the leverage ratio degree has originated from utilizing profitability measures of the FSIs with return on equity ratio as dependent variable and total assets to equity ratio as well as other main indicators to provide empirical results of estimations shown in table 2. We use the multiple linear regression model with imbalanced panel data to find out whether the leverage ratio degree is significantly positive as expected or not as well as the impact of leverage ratio conditioned by the economic boom or bust in which the coefficient is statistically anticipated to be negative.

We have demeaned return on equity as profitability or earning indicator, asset quality measures representing non-performing loans ratios, net profit to earning assets ratio signifying profit margin as another earning indicator as well as the return on assets, total loans to total deposits ratio denoting management, liquid assets to total deposits ratio representing liquidity status

of the Iranian banking network, leverage ratio (total assets to equity), GDP growth rate as macroeconomic variable and a dummy of the cross multiplication of the leverage ratio and GDP growth to depict the contemporaneous effect.

Table 2: Empirical Results of Panel Regression for ROE

Variables	(1) LROE Pooling Data Estimation	(2) LROE Fixed Effect Estimation	(3) LROE Random Effect Estimation
LNPLTTL	-0.023*** (0.008)	-0.026** (0.011)	0.02** (0.008)
LNPLTTA	-0.29*** (0.081)	-0.3*** (0.082)	-0.28*** (0.07)
LNPLTE	0.32*** (0.08)	0.33*** (0.084)	0.3*** (0.07)
LNPTEA	0.037*** (0.012)	0.043 (0.028)	0.03** (0.013)
LROA	0.96*** (0.013)	0.95*** (0.028)	0.96*** (0.014)
LTLTTD	-0.005** (0.002)	-0.002** (0.661)	-0.003 (0.002)
LLATDD	0.002** (0.001)	0.003* (0.002)	0.002** (0.001)
LLEV2	0.68*** (0.081)	0.67*** (0.083)	0.7*** (0.07)
GDP_G	0.0004** (0.0002)	0.0005** (0.0002)	0.0004** (0.0002)
LLEV2D_GDP_G	-0.012*** (0.003)	-0.007 (0.004)	-0.009** (0.003)
constant	-0.012*** (0.003)	-0.004*** (0.006)	-0.009** (0.003)
No.obs.	93	93	93
R-squared	0.99	0.99	0.99
Number of banks	31	31	31

Source: Authors' Calculations

Note: Standard errors in parentheses; the significant parameters are indicated as such with ***, **, * indicate significance at 1%, 5% and 10% levels.

The model fits the panel data (Random effect) estimation and has significant coefficients while Hausman test decides between fixed and Random-effect model. According to table 3, the estimation result from the Hausman test determines that Random-Effect must be selected in order to interpret the coefficients. The result from table 3 shows that we use Random-Effect as the ultimate empirical model because in the regression result for ROE, Hausman statistics is 7.05.

Table 3: Hausman Test for ROE

Variables	Coefficients		(b-B) Difference	Sqrt [diag(V_b-B)] S.E.
	(b) FE	(B) RE		
LNPLTTL	-0.026	-0.02	-0.006	0.008
LNPLTTA	-0.3	-0.28	-0.024	0.029
LNPLTE	0.331	0.302	0.029	0.032
LNPTEA	0.043	0.03	0.012	0.024
LROA	0.958	0.969	-0.011	0.024
LTLTDD	-0.002	-0.003	0.001	0.004
LLATDD	0.003	0.002	0.001	0.001
LLEV2	0.67	0.707	-0.031	0.031
GDP_G	0.0005	0.0004	0.0001	0.0001
LLEV2D_GDP_G	-0.007	-0.009	0.002	0.002
Test: Ho:	b=consistent under Ho and Ha B= inconsistent under Ha, efficient under Ho difference in coefficients not systematic $\chi^2(8) = (b-B)'[(V_b-V_B)^{-1}](b-B) = 7.05$ Prob> $\chi^2=0.7206$ (V_b-v-B is not positive definite)			

Source: Authors' calculations

The NPL ratio denoted by the logarithm of non-performing loans to total loans and total assets has significantly-negatively influenced the return on equity ratio since higher NPLs enforce the banks to store higher reserve for the non-performing loans in order to prevent failure. Therefore, higher NPLs are considered to have higher cost in the profit/loss statement which can obviously diminish the profitability of the banks.

The coefficients regarding the profit margin and return on assets indicated by LNPTEA and LROA are positively significant which can be interpreted as higher profit margin causes higher return on equity to emphasize the direct relationship and causality among the profitability variables.

The management ratio depicted by the logarithm of total loans to total deposits has a negative correlation with the return ratio though the coefficient is border-insignificant. This shows that banks higher NPLs ratio and increasing amount or ratio of total loans to total deposits does not necessarily augment banks' profitability since it can shrink the profit before tax.

The leverage ratio coefficient defined as the logarithm of total assets to total equity signifies that as banks increase their leverage ratio, they will directly identify profit, and their return on equity will improve. Therefore, the estimation result for this variable is as it was anticipated. However, the dummy variable which is constituted by the multiplication of leverage ratio and the GDP growth underscored by one as for boom and zero as for bust, registered a negative relationship with the ROE as it was expected for the Iranian banking network. It appears that during the bust period of 2012-13, the cost push driven by the higher leverage in line with inappropriate return of investments has led to the negative impact of the leverage on the return on equity ratio. Henceforth, it can be interpreted as the need for further adjustment in banks' asset portfolio as well as more accuracy of customers' credit rating when lending as well as promulgate for less expensive funding and financial resources for the banks which are the key tasks of the regulator of the banking system to be actively monitoring the trends of key financial soundness indicators i.e. the central bank of Iran on one hand, and banks' on sight and off sight supervision and surveillance departments in order to adjust strict strategies and internal bank auditing for assets/liability management. Leverage ratio degree during the bust is highlighted as negative which replicates a higher cost for lower return for the banking network that gives an alarm for credit rating, optimizing financial resources as well as higher quality of portfolio management.

6. Conclusions

Financial and economic conditions are tightly interrelated with each other specifically when boom and bust repeatedly take place and the banking network has to adjust their performance with them in such a way that lack of proper return from investments as well as lending profits could not have a major impact on the banking network. A decent measure that can help regulators and banks supervisors to monitor their performance is the degree of ratio analysis which has been calculated in this study. The higher the leverage ratio, the higher the bank's profitability provided that the economy is in a boom state, but failure might be coming up to the banking network if lower profitability is recorded during bust from higher levels of leverage. With an analytical-statistical look at the history of the Iranian banking network during 2006-13 data and suggesting a panel data model for the leverage ratio degree this study has been conducted to estimate the relationship between profitability and leverage ratio.

As it was anticipated, results show that banks should adjust their balance sheets to move towards target leverage ratios, with both assets and liabilities to be adjusted. This is because the risk of failure may rocket when banks do not adjust their equity in line with changes in their assets and liabilities which could be interpreted as banks follow their conventional path in financial intermediaries where they make portfolio of assets in order to make profit. The banking situation worsens when higher leverage degree during the bust which would cause difficulty in responding the deposits they have raised from the depositors and paid capital from the shareholders. Leverage ratio degree is obviously a good measure to indicate whether banks are taking adventurous risk of increasing their costs for lower returns. The leverage ratio degree shows that both equity and liabilities tend to adjust to move leverage positively without considering the state of the economy of Iran. On the other hand, the index of leverage's coefficient conditioned by the state of the economy is negative which replicates that banks tend to experience a negative impact of leverage on the return to equity as a result of cost push due to higher ratio of assets to equity in the bust and inappropriate return on investment. Furthermore, leverage degree during the bust is highlighted as negative which replicates a higher cost for lower return for the banking network that gives an alarm for credit rating, optimizing financial resources as well as higher quality of portfolio management which reminds us the need for portfolio

diversification which appears to be essential so that banks have to adapt their revenue situations with the state of the economy.

Regulatory and supervisory steps have to be taken by the central bank along with the Iranian banks at least to monitor and manage banks financial resources as well as how they use the funding from expensive deposits which could be a trigger to provide new approaches for raising less expensive financial resources. Capital restructuring is vital since institutions strive to make the most efficient use of limited finance; the key consideration is where banks expand and scale back. One clear trend is the renaissance of classic banking as unsustainable and over-leveraged structures give way to simpler and more transparent forms of banking business which should include moving away from an originate-to-distribute model towards a renewed focus on credit quality and relationship-driven banking. The ability to build enduring relationships through customer service, understanding and the ability to adapt to tougher regulatory controls will be key competitive differentiators in this environment. Effective capital restructuring will help to streamline what are often overly complex and diffuse banking groups. In turn, divestment will provide well-capitalized banks with openings as well as disclosed monetary markets which are also essential as windows of opportunity.

References

- Abbas, Q. et al. (2014). "Financial Performance of Banks in Pakistan after Merger and Acquisition", *Journal of Global Entrepreneurship Research*, No.4-Vol.13
- Aburime, U. T. (2007). "Determinants of Bank Profitability: Company-level Evidence from Nigeria", *European Journal of Scientific Research*, 19(3), 438-452.
- Acaravci S.K., and A. E. Calim, (2013). "Turkish Banking Sector's Profitability Factors". *International Journal of Economics and Financial Issues*. Vol. 3, No. 1, pp. 27- 41. *African Journal of Accounting, Economics, Finance and Banking Research*, 2, 58-82.
- Adrian, Tobias and Hyun Song Shin, (2010). "Liquidity and Leverage", *Journal of Financial Intermediation*, Volume 19, 418-437.
- Adrian, Tobias and Hyun Song Shin, (2011). "Financial Intermediary Balance Sheet Management", *Federal Reserve Bank of New York Staff Report No. 532*.

Ashcraft, Adam, (2008). "Are Bank Holding Companies a Source of Strength to Their Banking Subsidiaries?" *Journal of Money, Credit and Banking*, Volume 40, 273-294.

Athanasoglou P.P., et al., (2008). "Bank-Specific, Industry-Specific and Macroeconomic Determinants of Bank Profitability". *Journal of International Financial Markets, Institutions and Money*, Vol. 18, No. 2, pp. 121-136.

Barakat, Abdallah. (2014). "The Impact of Financial Structure, Financial Leverage and Profitability on Industrial Companies Shares Value (Applied Study on a Sample of Saudi Industrial Companies)", *Research Journal of Finance and Accounting*. Vol.5, No.1.

Berger, Allan and Gregory Udell, (1994). "Did Risk-Based Capital Allocate Bank Credit and Cause a Credit Crunch in the United States?" *Journal of Money, Credit and Banking*, Volume 26, No. 3, Part 2,585-628.

Berger, Allan. Robert DeYoung, Mark Flannery, David Lee and Ozde Oztekin, (2008). "How Do Large Banking Organizations Manage Their Capital Ratios?" *Journal of Financial Services Research*, Volume 34, 123-149

Berger, AN. (1993). "Distribution-free Estimates of Efficiency in the U.S. Banking Industry and Tests of the Standard Distributional Assumptions", *Journal of Productivity Analysis* 4, pp. 262–292.

Berrospeide, Jose and Rochelle Edge, (2010). "The Effects of Bank Capital on Lending: What Do We Know, and What Does It Mean?" *International Journal of Central Banking*, December, 5-54.

Bond, Stephen, (2002). "Dynamic Panel Data Methods: A Guide to Micro Data Methods and Practice", *University College London Working Paper*.

Brei, M. and L. Gambacorta, L., (2014). "The Leverage Ratio Over the Cycle", *Bank for International Settlements Working Paper*, Monetary and Economic Department, No 471.

Choi, In., (2001). "Unit Root Tests for Panel Data", *Journal of International Money and Finance*, Volume 20, 249-27.

D'Hulster, Katia, (2009). "The Leverage Ratio: A New Binding Limit on Banks", the *World Bank Group*, Financial and Private Sector Development Vice Presidency, No.11.

Damar, Evren, Cesaire Meh and Yaz Terajima, (2013). "Leverage, Balance Sheet Size and Wholesale Funding". *Journal of Financial Intermediation*, Volume 22, pages 639-662.

Dietrich A., and G. Wanzenried G., (2010). "Determinants of Bank Profitability Before and During the Crisis: Evidence from Switzerland", available on-line at SSRN: <http://ssrn.com/abstract=1370245>

Geanakoplos, John, (2010) "The Leverage Cycle" In Daron Acemoglu, D Kenneth Rogoff and Michael Woodford, eds., *NBER Macroeconomic Annual*, Volume 24, pages 1-65, University of Chicago Press.

Greenlaw, David, Jan Hatzius, Anil Kashyap and Jeremy Stein, (2008). "Leveraged Losses: Lessons from the Mortgage Market Meltdown", *Proceedings of the U.S. Monetary Policy Forum Report No. 2*, University of Chicago, Booth School of Business.

Gujarati, D. N., (2003). *Basic Econometrics* 4th Edition. New York: McGraw Hill.

Hancock, Diana, and James Wilcox, (1993). "Has there been a "Capital Crunch" in Banking? The Effects on Bank Lending of Real Estate Market Conditions and Bank Capital Shortfalls." *Journal of Housing Economics*, Volume 3, 31-50.

Hancock, Diana, and James Wilcox, (1994). "Bank Capital and Credit Crunch: The Roles of Risk- Weighted and Un-weighted Capital Regulations." *Journal of the American Real Estate and Urban Economics Association*, Volume 22, 59-94.

Hatzius, Jan, (2008). "Beyond Leveraged Losses: The Balance Sheet Effects of the Home Price Downturn", *Brookings Papers on Economic Activity*, (fall, 2008), 195-227.

Hester, DD & JF Zoellner, (1966). "The Relation between Bank Portfolios and Earnings: an Econometric Analysis", *Review of Economics and Statistics* 48, 372-386.

Im, Kyung So, M. Hashem Pesaran, and Yongcheol Shin, (2003). "Testing for Unit Roots in Heterogeneous Panels" *Journal of Econometrics*, Vol. 115 (1), 53-74.

Judson, R. and A. Owen, (1999). "Estimating Dynamic Panel Data Models: A Guide for Macroeconomists", *Economics Letters*, Volume 65, 9-15.

- Kosmidou, K, F. Pasiouras, & J. Floropoulos, (2004). "Linking Profits to Asset-liability Management of Domestic and Foreign Banks in the UK", *Applied Financial Economics* 14, 1319-1324.
- Kwast, ML & JT. Rose, (1982), "Pricing, Operating Efficiency, and Profitability among Large Commercial Banks", *Journal of Banking and Finance* 6, 233-254.
- Naceur, S.B., & M. Goaied, (2008). "The Determinants of Commercial Bank Interest Margin and Profitability: Evidence from Tunisia", *Frontiers in Finance and Economics* 5(1), 106-130.
- Nissim, D. and H. Penman, (2003). "Financial Statement Analysis of Leverage and how it Informs About Profitability and Price-to-Book Ratios", *Review of Accounting Studies*, No. 8, P 531–560.
- Roman & Danuletiu, (2013), "An Empirical Analysis of the Determinants of Bank Profitability in Romania", *Annales Universitatis Apulensis Series Oeconomica*, 15(2), 2013, 580-593
- Shahchera, Mahshid. (2012). "The Impact of Liquidity on Iranian Bank Profitability", *Journal of Money and Economy*, Vol. 7, No. 1.
- Sufian F., (2010). "Financial Depression and the Profitability of the Banking Sector of the Republic of Korea: Panel Evidence on Bank-specific and Macroeconomic Determinants". *Asia-Pacific Development Journal*, Vol. 17, No. 2, pp. 65- 92.
- Valverde, S. & F. Fernandez, (2007). "The Determinants of Bank Margins in European Banking," *Journal of Banking and Finance* 31(7), 2043-2063.
- Vasiliou, D. (1996),r"Linking Profits to Greek Production Management", *International Journal of Production Economics*, 43, 67-73.

Appendices

Appendix I-Pooling Data Estimation Results for ROE

Source	SS	df	MS			
Model	25.609732	10	2.5609732	Number of obs =	93	
Residual	.001264282	82	.000015418	F(10, 82) =	.	
				Prob > F =	0.0000	
				R-squared =	1.0000	
				Adj R-squared =	0.9999	
Total	25.6109963	92	.278380395	Root MSE =	.00393	

lroe	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnpltt1	-.0236513	.0080264	-2.95	0.004	-.0396183	-.0076843
lnpltta	-.298494	.0815903	-3.66	0.000	-.4608032	-.1361848
lnplte	.3238186	.0823293	3.93	0.000	.1600395	.4875977
lnptea	.0373217	.0129581	2.88	0.005	.0115439	.0630995
lroa	.9625606	.013091	73.53	0.000	.9365185	.9886027
ltltd	-.0053899	.0023723	-2.27	0.026	-.0101091	-.0006708
llatdd	.0029104	.0011887	2.45	0.016	.0005457	.005275
llev2	.6883734	.0818573	8.41	0.000	.525533	.8512137
gdp_g	.0004679	.0002319	2.02	0.047	6.57e-06	.0009293
llev2d_gdp_g	-.012469	.0038636	-3.23	0.002	-.020155	-.0047831
_cons	-.0120069	.0037381	-3.21	0.002	-.0194432	-.0045706

Appendix II-Fixed-Effect Estimation Results for ROE

Fixed-effects (within) regression	Number of obs =	93
Group variable: code	Number of groups =	22
R-sq: within = 0.9999	obs per group: min =	1
between = 1.0000	avg =	4.2
overall = 0.9999	max =	6
corr(u_i, xb) = -0.3796	F(10, 61)	40768.79
	Prob > F	0.0000

lroe	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnpltt1	-.0263035	.0115027	-2.29	0.026	-.0493046	-.0033025
lnpltta	-.305124	.0826721	-3.69	0.000	-.4704369	-.139811
lnplte	.3319214	.0842114	3.94	0.000	.1635304	.5003125
lnptea	.0434157	.0285267	1.52	0.133	-.0136268	.1004583
lroa	.9586135	.0285205	33.61	0.000	.9015832	1.015644
ltltd	-.0023063	.0052295	-0.44	0.661	-.0127634	.0081508
llatdd	.0039845	.002274	1.75	0.085	-.0005627	.0085316
llev2	.6759365	.0835754	8.09	0.000	.5088172	.8430558
gdp_g	.0005584	.0002376	2.35	0.022	.0000832	.0010336
llev2d_gdp_g	-.0073257	.0047034	-1.56	0.125	-.0167307	.0020794
_cons	-.0043695	.0064452	-0.68	0.500	-.0172574	.0085185
sigma_u	.00376626					
sigma_e	.00356499					
rho	.52743277	(fraction of variance due to u_i)				

F test that all u_i=0: F(21, 61) = 1.83 Prob > F = 0.0348

Appendix III-Random-Effect Estimation Results for ROE

```

Random-effects GLS regression              Number of obs   =   93
Group variable: code                       Number of groups =   22

R-sq:  within = 0.9998                    obs per group: min =    1
      between = 1.0000                      avg =           4.2
      overall  = 0.9999                      max =           6

corr(u_i, X) = 0 (assumed)                wald chi2(10)   =  1.07e+06
                                           Prob > chi2     =  0.0000
    
```

	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
lnp1tt1	-.0200068	.008158	-2.45	0.014	-.0359962 -.0040174
lnp1tta	-.2810929	.077063	-3.65	0.000	-.4321335 -.1300522
lnp1te	.3022079	.0778178	3.88	0.000	.1496879 .4547279
lnp1tea	.0304724	.0139849	2.18	0.029	.0030624 .0578824
lroa	.9698014	.0141437	68.57	0.000	.9420802 .9975226
lt1tttd	-.0035805	.0026171	-1.37	0.171	-.00871 .0015491
llatddd	.00265	.001329	1.99	0.046	.0000452 .0052549
llev2	.7070457	.0774028	9.13	0.000	.5553389 .8587525
gdp_g	.0004324	.0002154	2.01	0.045	.0000102 .0008546
llev2d_gdp_g	-.0097797	.0038062	-2.57	0.010	-.0172398 -.0023196
_cons	-.0090796	.0039789	-2.28	0.022	-.0168781 -.001281
sigma_u	.00204658				
sigma_e	.00356499				
rho	.24787355	(fraction of variance due to u_i)			

Appendix IV-Hausman Test for ROE

	Coefficients		(b-B) Difference	sqrt(diag(v_b-v_B)) S.E.
	(b) fe	(B) re		
lnp1tt1	-.0263035	-.0200068	-.0062968	.0081092
lnp1tta	-.305124	-.2810929	-.0240311	.0299327
lnp1te	.3319214	.3022079	.0297135	.0321862
lnp1tea	.0434157	.0304724	.0129433	.0248635
lroa	.9586135	.9698014	-.0111879	.0247664
lt1tttd	-.0023063	-.0035805	.0012742	.0045275
llatddd	.0039845	.00265	.0013345	.0018452
llev2	.6759365	.7070457	-.0311092	.0315221
gdp_g	.0005584	.0004324	.000126	.0001003
llev2d_gdp_g	-.0073257	-.0097797	.002454	.0027631

b = consistent under H0 and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under H0; obtained from xtreg

Test: H0: difference in coefficients not systematic

$$\begin{aligned}
 \text{chi2}(10) &= (b-B)'[(V_b-V_B)^{-1}](b-B) \\
 &= 7.05 \\
 \text{Prob}>\text{chi2} &= 0.7206
 \end{aligned}$$