



The Relationship between Firmness and Financial Performance in Stock and Overstock Banks

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Abstract: Different determinants of the banks' profitability are investigated in the literature extensively and in detail. While less is done regarding the scrutiny of the banking sector profitability in emerging markets. In determining the internal factors affecting the performance of banks in Iran, an analysis using panel data has been carried out over a period of six years 1390 to 1395. In this research, the relationship between the performance of the bank and financial strength in the bank has been investigated in eleven banks accepted in Iranian stock exchanges using panel data regression. The results show that the capital adequacy variable does not have a significant effect on the equity performance index. In the case of the variable ratio of deferred loans, it can be seen that this variable has a negative relationship with the return on equity of the equity holders. Also, the level of liquidity of the bank and the margin of interest to gross income also has a negative relationship. As a result, in order to increase profitability, banks need to take care of the quality of the loans they provide.

Keywords: Banking Sector Profitability, Internal Determinants, Financial Soundness Indicators

INTRODUCTION

Banks, as the most important financial intermediaries worldwide, are important and vital for the economic development of the countries. In fact, banks' performance directly influences the money market of the countries and such an effect, on the other hand, is effective in the entire economic aspects. The banks' shares have been offered in the stock exchange market to be transacted as a result of which the investors can gain profits by making investments in the banks' shares. But, the investigation and analysis of the banks' shares offered in the stock exchange market differs from the study of the shares of the ordinary manufacturing and service companies. The banks' output takes the form of financial services hence different from that of the manufacturing and service firms.

Banks constitute an important component of the financial system in the majority of the countries and they, as financial intermediaries, play a determinant role in the acquisition of economic growth and development. The development of the banking industry and the enhancement of the efficiency of the bank's performance can cause the long-term prosperity of the economy. On the contrary, underdeveloped banking systems bring about reductions in the economic growth (Shahchera and Jawzadani, 2012). The position of the financial sector of the economy (money and capital market) and, specifically, the banking industry is of a great importance in the corroboration of investment and enhancement of the economic growth hence the financial sector of the economy has always been a primary locus of the governments' policy-making in line with the actualization of macro-level economic objectives. In other words, banks are the foundations of the banking system of every country,

especially in developing countries wherein the capital markets are underdeveloped (Zhang et al, 2013). Banks are financial institutions that collect money from various sources and put it in the hands of the sectors that are in need of cash. So, they are considered as the vital artery of the economy in each country. Demands for the various kinds of banking services are considerably increased with the entry of the private banks to the money market in such a way that the banks compete with one another parallel to increasing their market quotients and profitability and they take advantage of various methods of improving their banking operations to attract the customers. Thus, evaluation of their performance is of a special importance and it has currently become one of the most important activities of the managers and employees.

On the other hand, performance evaluation is enumerated as one of the most significant managerial activities in various organizations. The current situations can be recognized using performance evaluation in every organization and it is by means of this recognition that proper plans and programs can be devised to improve the statuses and situations. Banks constitute one of the most critical economic sectors of a country that are in an intense need for performance evaluation. Banks, as the countries' money artery and as the most important sector of financial supply, are the propellers of the economy. Investigation of the banks' performance provides for reaching better performance to the maximum possible extent via making appropriate plans based on a prior recognition of the weak points.

Furthermore, banks' healthiness is of a particular importance for the overall economy of a country because bankruptcy or the unhealthy banks cause the investors' trust to suffer in a financial system as a result of which lower and fewer loans are offered that will eventually result in the reduction in economic growth and stagnation. In addition, bankruptcy can be accompanied by extravagant losses to the shareholders, investors, creditors, managers, staff and clients.

Considering the influential and important role of financial strength of the banks in their performance, the present study investigates the relationship between performance and financial strength in the banks. To achieve this goal, the following sections deal with the introduction of the theoretical foundations and study background, study model and the results and suggestions.

Theoretical Foundation and Study Background:

Banks' Performance:

Constant improvement of the organizations' performance creates a huge synergistic force that can support the growth and development program and provide the organizations with sublimation opportunities. The governments and organizations and institutions spend effective efforts in this regard. The constant improvement of the performance is not feasible without investigation and acquisition of awareness of the extent to which progress has been made and objectives have been accomplished and also without having insight of the challenges with which the organizations are faced as well as without receiving feedbacks and being informed of the degree to which the codified policies have been implemented and additionally without the identification of the cases requiring serious improvement. All of the aforementioned cases are not possible without measurement and evaluation. Things that cannot be measured cannot be controlled and things that cannot be controlled cannot be managed. The main issue in all of the organizational analysis is performance and its improvement entails measurement hence organizations with no performance measurement evaluation system are far from imagination (Satna, 2015).

Performance evaluation is a process that deals with the assessment and measurement, valuation and judgment about the performance for a specified period of time.

Performance evaluation in organizational aspect is usually synonymous to the effectiveness of the activities. By effectiveness, the extent to which the objectives are accomplished and the programs are implemented with efficient activities and operations is intended. Generally, performance evaluation system can be defined as the process of assessing and measuring and comparing the amount and the method of achieving an optimum

situation based on specified scales and attitudes within a specific area using certain indices for a specific period of time with such objectives as continuous revision, correction and improvement.

Institutions and organizations and executive organs with whatever the mission, prophecy and perspective are to eventually act within a national and/or international realm hence are required to remain accountable to the customers, clients and beneficiaries so that the company the objective of which is profitability and customer satisfaction and the organization the goal of which is the perfect and precise implementation of its legal duties and contribution to the actualization of the development and sublimation of the country could stay as responsive as possible. Therefore, the examination of the performance results is considered as an important strategic process. The quality and the effectiveness of the management and its performance are the determinant and vital factors giving rise to the actualization of the society's programs of development and welfare. Offering various services and producing different products and supplying of the costs from appropriate sources, being sufficiently sensitive to the investigation of objective accomplishment, constant improvement of quality, enhancement of the customers and citizens' satisfaction are performance goals of the organizations, managers and employees. In case that performance evaluation is carried out based on procedural approaches in a continuous and correct manner, enhancement and accountability of the executive organs and public trust in the performance of the organizations and efficiency and effectiveness of the government could come about in governmental sector. This can cause resource management enhancement, customer satisfaction, contribution to the national development, creation of novel capabilities, sustainability and enhancement of global class of the companies and institutions in the non-governmental sector, as well.

Essentially, the experimental studies take advantage of two rival approaches for the investigation of banking operations: transactional approach and subjective theory of business entity. The former was first expressed by Hu and Sanders in 1981 and it was later on developed in 1985 by McShin and Sharp. The approach assumes banks as dynamic transacting parties meaning that the banks take measures in line with removing the asymmetry in the loan demand and deposit supply through regulating the interest rates pertaining to them. The subjective theory of business entity that was proposed by Klein and Monti adopts a static approach to the banking foundations in such a way that it believes that the demand and supply of the loans and deposits simultaneously liquidates both of the markets. Although the transaction approach encompasses the markets and the effects of the institutions, such a factor cannot be directly embedded into a model. So, the majority of the recent studies have taken the effects of internal factors (banking specifications) and external factors (market and macro-economy specifications) on banks' profitability into account (Sofian and Habibullah, 2012).

In a number of studies, elaboration of the effect of factors influencing the banks' profitability has been undertaken based on the paradigm introduced in structure-conduct-performance (SCP) theory. Each market is composed of three elements: structure, conduct and performance and the form, type and organization of markets are determined according to the nature and the way of these elements' interrelationships.

Market structure is in fact the set of the organizational characteristics of the market the identification of which paves the way for determining the nature of pricing and competition in the market (Shahchera and Jawzadani, 2012). In other words, the market structure points to the degree to which a market is concentrated on an industry and this is indicative of the competition degree in a given industry (Lee and Hsieh, 2013). Structural change refers to the economic status that occurs during behavioral change in an industry or market. From the perspective of the industrial organizations, structural changes of the market influence the industry structure and depend on the level of competition in the intended market (Muhammad et al, 2015).

Business entities' conduct is a pattern employed by them for coordinating themselves to the market conditions. Various aspects of entities' conducts in the markets are as outlined below:

- Objectives of price determination
- Making decisions for improving quality and/or changing the product plan
- Sale enhancement policies

Economic performance includes a collection of effects and results originating from economic activities. Economic performance features diverse aspects but, in an investigation of the business entities' performance, the economists pay a greater deal of attention to such aspects as profitability, efficiency and productivity.

Structure-conduct-performance theory states that the banks are less intended towards collusion with one another for attaining profits beyond the ordinary levels in a very centralized banking market wherein the competition is low. To put it differently, the assumption discusses the idea that the banking profitability is extracted from the market structure (Tan, 2015). In fact, in a centralized market, the banks demand high rates for the interest of their loans and, in the meantime, offer lower rates of interest on the deposits and the banks are indeed capable of extracting and possessing exclusive rents in such a market (Ibid). It is believed in this theory that the causality is directed from structure to conduct thence to performance. The proponents of this theory believe that the business entities' conduct and their decisions for cooperation, coalition and/or competition with one another are influenced by the market structure. In sum, the aforesaid assumption is expressive of the positive relationship between market centralization and performance as evidenced in the literature related to the industrial organizations (Zhang et al, 2013).

The way these three elements of market influence one another and the quality of their relationships are elucidated from the perspective of this theory by the following equation:

Performance= f (structure, conduct, internal organization and external conditions)

In this functional relationship, the independent variables are placed on the right-hand side and the performance as the dependent variable has been placed on the left-hand side. Structure encompasses numerous elements and conduct, as well, embraces a vast spectrum of deeds and actions of the business entities. By the external conditions, the changes are intended that occur outside the industry but, in the meanwhile, influencing the industry and its related market such as evolution in the structure of demand and transferring of the demand function, introduction of technology and new method of production and their availability to the entities (Shahchera and Jawzadani, 2012, p.34).

Financial Strength:

Financial strength is usually defined using an antonymous description thereof. Financial strength refers to the situation wherein the financial and systematic crises cannot pose any threat to the macro-economy's stability. Financial crisis refers to an abrupt and rapid change in all or the majority of the financial indices, including the short-term interest rates, assets' prices (securities, shares, estates and land), bankruptcy and downfall of the financial institutions. While the prosperity or bubble is identified based on monetary raid towards the real or financial assets and it is based on expecting the continuation of the assets' price increase, the financial crisis is identified based on the sudden exit of the assets of the financial sector towards money. Such a conduct as thereverse of the first state is based on the belief that the assets' prices are declining (Jamaliyan, 2017).

Banks' financial strength is amongst the important indices of banking sector that points to the amount of banking system's stability against macro-level economic variables (such as inflation and GDP), factors of economic development and banking sector's centralization. Banks' financial strength, like their healthiness, is usually defined by an opposite statement. Financial crisis refers to an abrupt change in all or majority of the financial indices including short-term interest rates and assets' prices (securities, shares, estates and land) and bankruptcy and financial institutions' downfall while prosperity or bubble is identified based on monetary raid towards the real or financial assets that is based on expecting the continuation of the increase in the price of the assets. The financial strength takes place in a financial system featuring the following three conditions.

- 1) Having the ability to allocate economic resources in an efficient manner as well as the power of creating other economic processes (economic growth, public welfare and asset density).
- 2) Appropriately managing the pricing estimations, allocations and financial risk
- 3) Being capable of implementing the aforementioned cases even when external crises come about

One reason for the banks' fragility to the financial crises stems from their intermediary nature. The banks convert the short-term deposits to loans with long-term maturity. Therefore, the banks' balance sheets are

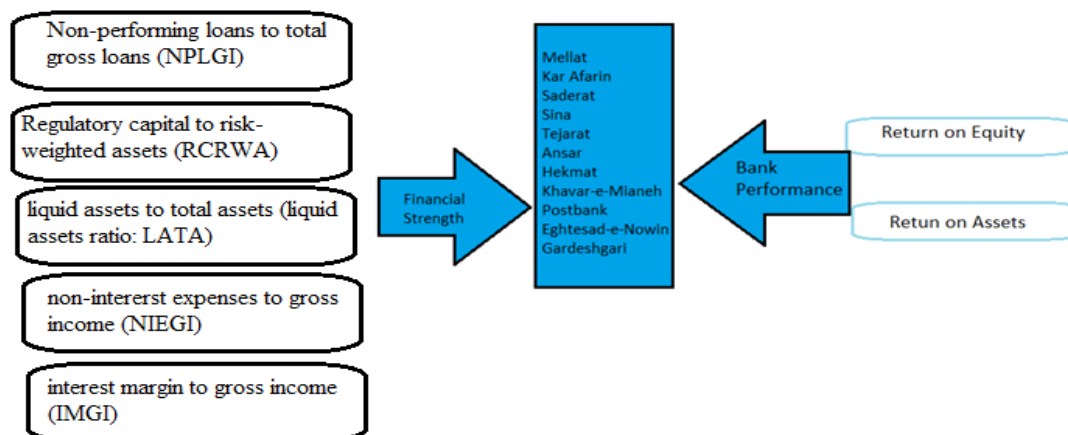
usually inflicted with maturity mismatches. On the other hand, banks cannot easily and readily recall the granted loans and there is in this regard a sort of inflexibility in the assets' side of the banks. Thus, the risks pertinent to financial strength need permanent care due to the vulnerability and inherent brittleness of the financial institutions, especially the banks (Ghelich et al, 2014).

In bank-related literature, bank leverages mean the way the resources are used in the balance sheet for the financial supply of the assets. The loans granted at the cost of the banks' capitals are utilized in the financial supply of the projects and other investments. Leverages also point to the riskiness of the assets in the balance sheets. In fact, financial leverages reveal the bilateral relationship between the resources and assets in the banks' balance sheets. So, the financial leverage plays an important role in and leads to the financial strength of the bank. To reach an appropriate banking output, there are selected many various techniques and strategies. One of the most important of these strategies is the specification of a proper capital structure. Essentially, banks are particularly sensitive to the minimization of the amount of capital intended for the maximization of return on equity. Using higher financial leverages, the banks can increase the return on equity. Of course, financial leverages can also be accompanied by higher risks and expose the banks to higher risks. Capital aggregation as a result of the loss risk is amongst the most important solutions adopted by them. Therefore, to protect their capitals and predict a good image of their financial power, the banks reduce their financial risk by adopting lower financial leverage positions. Financial decisions get complicated by banking operations and higher risk levels become related to the return on assets and this issue is associated with the financial risk creation (Ahmadpour, 2015).

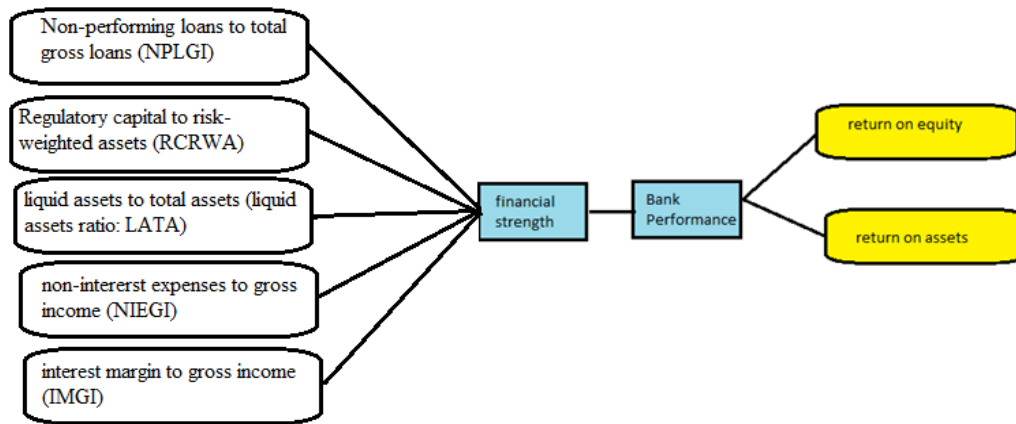
It can be concluded from the abovementioned discussions that the risks pertinent to financial strength need to be constantly monitored due to the vulnerability and inherent fragility of the financial institutions, especially the banks, thereto. Based on the investigations, no study has been so far conducted inside the country on the relationship between the performance and financial strength of the banks and the majority of the studies have explored the aspects of the banks' efficiency using data envelopment analysis (DEA) and examined the effects of factors other than financial strength on the banks' performance.

Study Data and Model:

The present study aims at the assessing of the relationship between bank performance (including two indices of return on equity and return on assets) and the financial strength of the banks (including five indices: non-performing loans to total gross loans, regulatory capital to risk-weighted assets ratio, liquid assets to total assets ratio, compulsory expenses to gross income ratio, interest margin to gross income ratio) in eleven banks (Mellat, Kar Afarin, Saderat, Sina, Tejarat, Ansar, Hekmat, Khavar-e-Mianeh, Post Bank, Eghtesad-e-Nowin and Gardeshgari) accepted to Iran's stock exchange market and over-the-counter (OTC) trading market in a six-year time span (from 2011 to 2016).



Based on the study conceptual model, the experimental modeling used herein seeks the discovery of the relationship between the independent and dependent variables as illustrated below:



To investigate the relationship, two regression models have been estimated as explained below:

$$ROE_{it} = \alpha_0 + \beta_1 NPLGI_{it} + \beta_2 RCRWA_{it} + \beta_3 LATA_{it} + \beta_4 NIEGI_{it} + \beta_5 IMGI_{it} + \varepsilon_{it} \quad (1)$$

$$ROA_{it} = \alpha_0 + \beta_1 NPLGI_{it} + \beta_2 RCRWA_{it} + \beta_3 LATA_{it} + \beta_4 NIEGI_{it} + \beta_5 IMGI_{it} + \varepsilon_{it} \quad (2)$$

Where,

ROE_{it} is the return rate of equity holders of bank i-th during t;

ROA_{it} is the return on asset of the bank i-th during t;

$NPLGI_{it}$ is the non-performing loans to total gross loans of the bank i-th during t;

$RCRWA_{it}$ is the regulatory capital to risk-weighted assets of bank i-th during t;

$LATA_{it}$ is the liquid assets to total assets ratio of the bank i-th during t;

$NIEGI_{it}$ is the compulsory costs to gross income ratio of the bank i-th during t;

$IMGI_{it}$ is the interest margin to gross income ratio of the bank i-th during t;

α_0 is the y-intercept of the regression equations

β_i are the explanatory variables' coefficients in the regression equations;

ε_{it} is the error term of the regression equations.

As it was pointed out, two scales, namely return on equity and return on assets, have been employed in an evaluation of the banks' performance.

- **The rate of return on equity (ROE):** it indicates that way the bank managers and employees have guided the banking operation in line with attainment of a higher return for the shareholders (owners). In fact, ROE is a general scale for the evaluation of managers' performance in achieving the shareholders' goals and it is reflective of the managers' ability in administrating financial and operational departments. Financial department management controls the position of the bank's capital. Herein, capital management means using leverage in capital structure in such a way that the shareholders can attain higher returns.
- **The rate of return on equity (ROE):** it is obtained via dividing the net profit by the book value of the equity (Albolesco, 2015).
- **Rate of return on assets (ROA):** it is the most common scale for evaluating the operations' profitability hence it is one of the most frequently applied ratios in banking industry. The ratio denotes the managers

and employees' ability in managing and using assets in the daily activities of the bank. In the meantime, it also reflects the reality that with what profitability rate and effectiveness the company's assets have been utilized. It is evident that the higher the net income for a certain amount of the assets, the higher the return, as well.

- **Rate of return on assets (ROA):** according to a study by Albosco (2015), ROA is obtained via dividing the net profit by the total assets.

Therefore, considering the influential and important role of the banks' financial strength in regard of their performance, such indices as financial strength, non-performing loans to total gross loans (NPLGL), regulatory capital to risk-weighted assets (RCRWA), liquid assets to total assets (liquid assets ratio: LATA), non-interest expenses to gross income (NIEGI) and interest margin to gross income (IMGI) have been investigated in the present study. The role of these indices will be evaluated in bank performance assessment scales, ROE and ROA.

- **Non-performing loans to total gross loans (NPLGL):** non-performing loans to total gross loans of the banks has been calculated as instructed in a study by Albosco from total gross loans' effect on the total value of the loan portfolio. Non-performing loans are expected to have negative effects on the departmental profitability of the banks.
- **Regulatory capital to risk-weighted assets (RCRWA):** as defined by Albosco, RCWA means using capital as a means of regulating the assets adjusted in terms of the risk. In measuring RCRW, the amount of the deposited money is used to determine the financial strength of the credit institutions and banks. The ratio indicates the ability of the bank in respect to the fluctuations influencing the balance sheet items. So, it can have a positive and significant effect on banks' profitability.
- **Liquid assets to total assets ratio (LATA):** banks should reserve sufficient cash for responding to the depositors and lenders' demands. Having insufficient amounts of cash can expose the banks to the obligational non-performance risk and bankruptcy.
- **Non-interest expenses to gross income ratio (NIEGI):** according to the extensiveness of the banks' operations in absorbing deposits and granting loans, controlling the company's operating costs is of importance in the operational efficiency and profitability of the banks in such a way that the operating costs to gross income ratio indicates the extent to which the banks rely on modern technologies in banking operations as well as the degree to which banks rely on their workforce and give value to the traditional banking system. It is evident that the banks concentrating on the modern banking technologies and distancing away from the traditional banking system will be more successful in this regard.
- **Interest margin to gross income ratio (IMGI):** this ratio expresses that what percent of the bank's income has been accounted for by the costs. The lower the ratio, the better the profitability status of the banks as a result of which the bank can perform financial supply and deposit reception operations at lower costs.

The analysis of the data is a multistage process in the course of which the data collected in various ways are summarized, categorized and finally processed to be subjected to different kinds of analysis so that their interrelationships could be figured out for the purpose of testing the hypotheses. In this part of the study, the data obtained from the study sample volume will be analyzed in such a way that the data are examined in two parts: the first includes descriptive statistics and deals with frequency, central indices and scattering indices of the data and the second part tests the hypotheses.

Table 1: descriptive statistics of the data

	ROE	NPLGL	RCRWA	LATA	NIEGI	IMGI
Mean	12.13258	17.42076	13.38455	2.422424	38.6336	73.31182
Median	14.80000	13.45500	8.530000	1.080000	41.74500	78.49000

Maximum	40.690000	109.4700	105.1100	17.19000	622.2300	161.5800
Minimum	59.60000	0.000000	1.95000	0.000000	1.434340	0.000000
Std. Dev.	15.29309	21.79579	16.57746	3.442825	206.0640	29.43810
Skewness	2.04000	3.101906	3.695655	2.731421	5.22000	0.39000
Kurtosis	9.858966	13.23286	18.49578	10.73167	41.91451	4.460661
Jarque-Bera	175.1609	393.7964	810.5640	246.4588	4464.066	7.537612
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.023080
Sum	800.7500	1149.770	883.3800	159.8800	2550.000	4838.580
Sum Sq. Dev.	15202.10	30878.67	17862.79	770.4478	0.2760055	56329.10
Observations	66.00	66.00	66.00	66.00	66.00	66.00
Cross-sections	11.00	11.00	11.00	11.00	11.00	11.00
Source: study calculations						

- **Data Durability Investigation:**

Before estimating the model, the durability of the variables used in the regression models has been investigated. Since the applied regression method is based on panel data, Lewin, Lin and Chu (LLC) method has been the method of choice for testing the data durability. The following table gives the results of data durability.

Table 2: data durability test

Variable	LLC value	Probability value	Test result
Return on asset (ROA)	-1.85613	0.0317	Durable
Return on equity (ROE)	-7.7672	0.0000	Durable
Non-performing loans to gross loans ratio (NPLGL _{it})	-9.81828	0.0000	Durable
Regulatory capital to risk-weighted asset ratio (RCRWA _{it})	-3.30082	0.0005	Durable
Liquid assets to total assets ratio (LATA _{it})	-2.58183	0.0049	Durable
Non-interest expenses to gross income ratio (NIEGI _{it})	-8.9821	0.0000	Durable
Interest margin to gross income ratio (IMGI _{it})	-5.95592	0.0000	Durable
Source: study calculations			

According to table (2), it is observed that all the variables are durable in 5% level. Thus, the following sections deal with the analysis of each regression model.

Study Findings:

A) Estimation of Model (1): ROE as the Dependent Variable

To determine a correct method of regression model estimation, F-Limer and Hausman test is used in such a manner that the cumulative effects are evaluated versus the constant effects in F-Limer test and the random effects versus the constant effects are evaluated in Hausman test. Of course, it is worth mentioning that in case that the F-Limer test's results signify the cumulative effects, there would be no need for Hausman test. Table (3) presents the results of F-Limer test.

Table 3: F-Limer test for Model (1)

F-Limer test			
Test statistic name	Test statistic amount	Statistic probability	Test result
Fisher statistic	0.212667	0.9907	Rejection of constant (panel) effects
Chi-square	2.662146	0.9762	Rejection of constant (panel) effects
Source: study calculations			

According to table (2), it is observed that the probability value pertaining to F-Limer test is above 0.05 meaning that the null hypothesis of the test is not rejected in 5% error level. In other words, it can be concluded that the study regression model should be estimated in cumulative effect state. So, there is no need for conducting Hausman test. Based thereon, the following part presents the regression model estimation.

Table 4: preliminary estimation of model (1) in cumulative (pooling) state

Variable	Coefficient	Standard deviation	Student's t-test	Statistic probability
y-intercept	19.35065	12.47765	1.550824	0.1281
NPLGL	-0.264573	0.329814	-0.802188	0.4268
RCRWA	-0.138850	0.189244	-0.733710	0.4670
LATA	-0.381347	0.600676	-0.634863	0.5288
NIEGI	0.003776	0.007093	0.532305	0.5972
IMGI	-0.206038	0.129431	-1.591872	0.1186
Explanatory coefficient (R ²)	0.103385	Fisher statistic	1.014692	
Adjusted explanatory coefficient (R ²)	0.001497	Fisher statistic probability value (Prob(F))		0.420564
Durbin-Watson statistic (D.W)	3.350904	Regression's standard deviation		15.51802
Source: study calculations				

The above table gives the results obtained from preliminary estimation of the regression model proposed in the current research paper. To ensure the efficiency of the estimated model, there is a need for performing the classic assumptions' violation tests.

- According to Jarque-Bera statistic as well as the probability value obtained for this statistic, it is observed that the errors term distribution function does not give normal distribution in 5% error level.
- According to the value, 3.35, obtained for Durbin-Watson statistic and based on its comparison to Durbin-Watson table, it is observed that it is situated in negative autocorrelation region. The same finding has also been confirmed in Breusch-Pagan test.
- Breusch-Godfrey test has been used to investigate the error terms variance inhomogeneity. According to the results of the test, it can be seen that the model lacks the error term variance inhomogeneity.

According to the tests pertinent to the classic assumptions violation, it was observed that the preliminary estimated model has abnormal distribution and autocorrelation in the error terms, to overcome the problem, first order autoregression process is used. Moreover, regression model (1) will be estimated in the weighted (i.e. GLS) state. Next, the model (1) is estimated again according to the aforesaid cases.

Table 5: final estimation of model (1)

Variable	Coefficient	Standard deviation	Student t-statistic	Probability statistic
y-intercept	6.434350	2.948171	2.182489	0.0363
NPLGL	-0.208786	0.056394	-3.702260	0.0008
RCRWA	0.017772	0.051036	0.348223	0.7299
LATA	-0.576628	0.105032	-5.490013	0.0000
NIEGI	0.016860	0.005755	2.929637	0.0061
IMGI	-0.078448	0.030909	-2.538036	0.0161
AR (1)	-0.604443	0.153084	-3.948429	0.0004
Explanatory coefficient (R ²)	0.504944	Fisher's statistic		5.609847
Adjusted explanatory coefficient (R̄ ²)	0.414933	Fighser's statistic probability value (Prob(F))		0.000423
Durbin-Watson statistic	1.979062	Regression standard deviation		14.19059
Source: study calculations				

Like before, it is required to carry out the classic assumptions violation tests for the estimated regression model. According to the results of the exploratory tests, it is observed that the error terms have normal distribution. Furthermore, considering the Durbin-Watson statistic, it can be concluded that the model does not have autocorrelation and this is confirmed using Breusch-Pagan test. In addition, based on Breusch-Godfrey test, the model is found with no variance inhomogeneity problem.

In this model, all of the variables, except the regulatory capital to risk-weighted assets ratio, are significant because the amount of the student t-statistic reported for the significant variables is below 0.05. As for the non-performing loans to total gross loans ratio, it can be seen that the variable is negatively associated with return on equity in such a way that one unit increase in the NPLGL ratio brings about a reduction by 0.2 units in

return on equity. Moreover, the banks LATA ratio and IMGI ratio, as well, have been found negatively correlated in such a manner that one unit increase in the banks' LATA ratio and/or IMGI ratio (in separate) respectively causes reduction by about 0.57 and 0.07 units in ROE. In between, a positive relationship was evidenced between the NIEGI ratio and ROE in such a manner that one unit increase in the former was found increasing the latter by 0.01 units. Also, it is observed in regard of the estimated model that it is significant in a 0.05 error level because the Fisher statistic pertaining to the estimated model is below 0.05. In addition, according to the adjusted explanatory coefficient, it can be seen that the model variables have been capable of explaining 41% of the changes in the main variable, i.e. ROE.

B) Model (2) Estimation: ROA as the dependent variable

Like the previous model, in order to determine the correct way of regression model estimation, F-Limer and Hausman tests are employed. Table (6) offers the results obtained from F-Limer test.

Table 6: F-Limer test of model (2)

F-Limer test			
Test statistic name	Test statistic value	Probability statistic	Test result
Fisher Statistic	3.889983	0.0017	Rejection of the cumulative (Pooling) effects
Chi-square	34.664394	0.0001	Rejection of the cumulative (Pooling) effects
Source: study calculations			

According to the results given in table (6), it can be observed that amount of probability statistic pertaining to F-Limer test is below 0.05 that means the null hypothesis is rejected in a 5% error level. In other words, it can be concluded that the cumulative effects state is not accepted. Therefore, Hausman test should be utilized to determine the two states of fixed effects and random effects.

Table 7: Hausman test for model (2)

Hausman test			
Test statistic name	Test statistic value	Probability statistic	Test result
Chi-square	30.928508	0.0000	Rejection of the random effects
Source: study calculations			

According to table (7), it is observed that the null hypothesis of the Hausman test indicating the existence of random effects is not accepted in a 5% error level. Therefore, the regression model (2) should be estimated in fixed effects state.

Table 8: preliminary estimation of model (2) in fixed effects state

Variable	Coefficient	Standard deviation	Student t-statistic	Probability statistic
y-intercept	2.615473	1.047378	2.497163	0.0174
NPLGL	0.024629	0.041254	0.597010	0.5543
RCRWA	0.034438	0.011937	2.884981	0.0067
LATA	-0.070351	0.033721	-2.086240	0.0443
NIEGI	-0.000162	0.000373	-0.433902	0.6670
IMGI	-0.022787	0.010488	-2.172723	0.0367
Explanatory coefficient (R ²)	0.856349	Fisher's statistic		14.90331
Adjusted explanatory coefficient (R ²)	0.798889	Fighser's statistic probability value (Prob(F))		0.000000
Durbin-Watson statistic	2.491452	Regression standard deviation		0.764416
Source: study calculations				

The above table presents the results obtained from preliminary estimation of the regression model proposed in the current research paper. To ensure the model' efficiency, it is seminally required to perform the classic assumptions violation test as follows.

- Jarque-Bera test is used to examine the normal distribution function of the error terms. In this test, Jarque-Bera statistic's probability value was found larger than 0.05 in an estimation of the model (2) and it is expressive of the idea that the error terms feature abnormal distribution. So, to overcome this problem, the regression model is estimated in weighted (GLS) state.
- To investigate the autocorrelation of the error terms of model (2) by means of Durbin-Watson table, it can be stated considering Durbin-Watson statistic being found equal to 2.4 that the test is incapable of determining the error terms' autocorrelation. Therefore, Breusch-Pagan test and Pesaran test are used to conduct a more exact investigation of the error term's autocorrelation. It can be seen based on the test results that the model does not have error term autocorrelation.
- To investigate the error terms' variance inhomogeneity, Breusch-Godfrey test has been employed the results of which indicated that the model does not have error terms' variance inhomogeneity.

Table 9: final estimation of model (2)

Variable	Coefficient	Standard deviation	Student t-statistic	Probability statistic
y-intercept	2.331725	0.405260	5.753654	0.0000
NPLGL	-0.006624	0.026156	-0.253263	0.8015
RCRWA	0.037031	0.002932	12.63171	0.0000
LATA	-0.087573	0.022760	-3.847737	0.0005
NIEGI	-1.59E-06	0.000295	-0.005393	0.9957
IMGI	-0.013842	0.002352	-5.886373	0.0000
Explanatory coefficient (R ²)	0.930936	Fisher's statistic		33.69811
Adjusted explanatory coefficient (R ²)	0.903310	Fighser's statistic probability value (Prob(F))		0.000000
Durbin-Watson statistic	2.554115	Regression standard deviation		0.734567
Source: study calculations				

It is observed based on the exploratory test results that the error terms enjoy normal distribution. Additionally, it can be concluded according to Durbin-Watson value that the model does not have autocorrelation and this has also been confirmed using Breusch-Pagan and Pesaran test. Based on Breusch-Godfrey test, it can be also stated that the model does not feature variance inhomogeneity.

All of the variables, except NPLGL ratio, are found significant in a 0.05 error level as documented in the final model (2) the estimation results of which have been given in table (9). The y-intercept of the model is 2.33. Also, a negative relationship was found between LATA ratio and IMGI ratio with ROA in such a way that one unit increase in LATA ratio and/or IMGI ratio of the bank (in separate) brings about reductions by 0.08 and 0.01 units, respectively, in ROA. It can also be seen that there is a positive relationship between RCRWA and ROA in such a manner that a unit increase in RCRWA causes an increase by 0.03 units in ROA. As for the estimated model, it can be seen that it is significant in a 0.05 error level because the Fisher statistic pertinent to the estimated model is smaller than 0.05. Moreover, it can be observed according to the adjusted explanatory factor that the model variables have been capable of explaining 90% of the variations of the main variable, i.e. ROA.

Conclusion and Suggestions:

According to the relationship between banking system's performance with macro-level economic sectors of the country, any instability, absence of solidarity and crisis in them can be accompanied by fluctuations and disorders in the macro-level economic variables. Thus, emphasizing on the intermediary role of the banks, investigation and safeguarding of the stability and healthiness of the banking system is of a great importance. Generally, stability and healthiness indices of the banking system are used to investigate and ensure the stability, financial strength and healthiness of the banks. Conceptually, a healthiness index can be derived of a definition, a given standard or a certain banking norm (based on professional experience, industry medium and so forth) or a combination of them while it is found accompanied by such an attribute as public agreeability (accepted by the scientific, banking and professional schools).

Financial strength of the banks should be considered from various aspects in banking. The banks' financial strength can be reflective of the banking resources' structure and financial supply of the banking assets. According to the banking stability and healthiness literature, base capital can contribute a lot to the banks in their compensation of the financial losses and capital is envisioned as a factor degrading the shocks and alleviating the risks of the lending process. On the other hand, the increase in the resources costs leads to the reduction of the banks' profitability hence lowering of their performance as a result of which the banks' capital is reduced and it is in this state that the banks should take the profitable opportunities of lending into account that can result in an increase in the interest rates. Increasing the interest rates by the banks serves the prevention of capital reduction in the banks at a future time.

Liquidity problems affect the income and capital of the banks and it, in acute cases, can cause the bank's bankruptcy. The banks might be forced to borrow cash sums from the market for a relatively high interest rate upon the emergence of liquidity crisis. This will eventually lead to the reduction in the banks' income. Moreover, over-borrowing as a measure sometimes taken by the banks might expose their capitals to risk. This problem can also increase the debt to equity ratio that would be followed by banks' doubling of their efforts for the preservation of capital structure.

According to the obtained results and based on the status quo of the economic conditions in Iran, the following policy-related recommendations are made:

- One way for reducing the risks related to financial strength and corroboration of the banks' capital stamina is reduction of offering credits that means banks' contraction in granting loans, by doing so, in lieu of transforming their assets to the loans for which equal sums of capital should be stored for being capable of standing the shocks, the banks convert them to the more cashable assets featuring lower or even zero weighted risk coefficients. Of course, it has to be pointed out that the solution is very costly in terms of social costs, especially when a country is faced with stagnation because it causes the stagnancy to become more deepened.
- There are other methods for the strengthening of the capital stamina of the banks that are directed at quality increase and/or supervisory capital quantity. Increasing the capital via issuing shares and/or converting the bank obligations to shares are ways of reinforcing the banks' capital stamina. These methods are also very costly under stagnancy conditions unless they are done by the government.
- The thing that has happened since long ago is that the banks, disregarding the necessity for corroborating their stamina, have depleted the resources. Thus, the profit should not be distributed as a measure that serves the corroboration of the banks' stamina like the other solutions mentioned above but with the difference being that the social costs stemming from the contraction and/or the costs of share increase are missing in this recommendation. The depletion of the cash resources of the banks even if the actualized profit is transformed into shares instead of being reserved poses risks to the solidity of the banks in the future. There is no doubt that this would not taste good to the palate of the investors who do not have long-term approach to the issue. However, if it is left unexpressed and unperceived, this accumulated loss would be piled up like a lie that will be revealed some day and it is preferred now to accept this bitter truth. So, the group of the investors who have a long-term look at the issue would receive a good reward for the patience in the future.
- In international level, such a policy as cash distribution of the dividend has intensively drawn the attentions of the officials recently and efforts have been made to exert a larger deal of supervision thereon. Both Federal Reserves and Basel Bank's Supervisory Committee have demanded the banks to use this policy in their capital adequacy to the maximum possible extent. As for the rewards paid to the board of directors out of profits banks make, there are currently enforced more strict regulations by the supervisory authorities. For example, in Germany, bank managers not only should base the rewards on a percentage of the same year's profit but also they should consider a mean value of the profits of several

years as the base of their reward donation. This is part of the extensive reformations that have been recently implemented for more supervision and control of the leadership and governance risks.

- The three principles that have to be taken into consideration when revising the regulations on the healthiness and solidarity of the banks are: comprehensiveness, consistency and continuation. In regard of comprehensiveness, it is necessary for the discussion on the revision of the supervisory regulations to go beyond the mere exertion of limitations on the dividend distribution and also there is a need for planning a comprehensive plan for the strengthening of the quality and quantity of the banks' capitals. The consistency is another principle dealing with the accordance of the regulations to the legal, managerial-motivational and information grounds. Undoubtedly, revision of the rules and regulations might come out as necessary in some places for the proper implementations of the new settings. Thus, the appropriate grounds should be provided and the legal prerequisites should also be met. Finally, it has to be mentioned that the supervisory axioms should be defined in such a way that no business be exposed to continuity risk.

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