*I J A B E R*, Vol. 14, No. 3, (2016): 1805-1818

# THE RELATIONSHIP BETWEEN LIQUIDITY AND CAPITAL ADEQUACY WITH NET PROFIT AND EQUITY OF SHAREHOLDERS OF BANKS

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***Abstract:*** *This study is aimed to evaluate the relationship between liquidity and capital adequacy with net profit and equity of banks. In this study liquidity, total basic fund to total risk-weighted assets (capital adequacy ratio), ratio of first tier capital to total assets, ratio of first tier capital to total risk weighted assets, ratio of fund paid of total assets is considered as independent variable. The study population includes 15 active banks in stock and over the counter (OTC) markets during 2010-2013 as evaluated for study hypotheses. In inferential statistics, to test the hypotheses of study and evaluaiton of the relations between variables, panel data regression method is applied and required analyses are performed by SPSS, Eviews, Excel software. The results of findings of study showed that core capital ratio (first Tier) to total assets, paid capital to total assets ratio, bank liquidity, bank size and net profit of previous year were effective on net profit of banks. The core capital (First Tier) to total assets, paid capital to total assets and debt to equity ratio showed the effect of these factors on return on equity.*

***Keywords:*** *Liquidity, Capital adequacy ratio, Return on equity, Net profit.*

## INTRODUCTION

Economic development of each society depends upon optimal use of internal and external capitals. Suitable investment in each society is an important part of duties of governments and all people in society. One of the main requirements of development is allocation of capital and financial resources as well and here the role of financial institutes is important as effective on equipment, supply and collection of capital and financial resources on one hand and its good allocation and distribution. The banks play important role in economy of our country. Indeed, the banks are the oldest, active and extensive financial brokerage and they play important role in good collection of financial resources (Pahlevanzade, 2007). Different needs of advanced communities and advancing communities

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and interference of governments in monetary market are used to fulfill various goals including development goals as banks are changed over time and are organized in different frameworks. Banking in Iran is formed with the same trend and based on economic and political conditions are developed in accordance to development views of policy makers and economic planners of countries. The environment in which banks are active is a competitive environment and to continue their life, the banks are obliged to compete with various factors at national and international level and extension of their activities via new investment. For investment, banks need financial resources but financial resources and using them should be determined to have profitable banks and this is the duty of manager of bank credits as determining financial resources and using them (Norani and Amiri, 2011). There are two groups of capital owner and investor in each society and there should be logical relation between two groups. In capital owner group, there are some people with cash and non-cash capitals but they can not be used by themselves for various reasons including shortage of capital, non-allocation, lack of opportunity, low risk taking and other factors, capital or saving can not be used in economic activities. In investor group, there are economic enterprises with required specialization to use liquid capitals in economic activities but they can be encountered with shortage of resources or capital for long-term and short-term investment. Thus, the broker group attempts to establish relationship between these two groups for capital owners regarding using capital or their saving and return and expected benefits of investors can be created. The formation and communication in capital markets is performed by stock brokers and stock markets in monetary and credit markets by funding institutions including banks and it has great role due to people recognition of banks and their trust in activity period. This study aimed to evaluate some effective factors including capital adequacy and liquidity on net profit and return on equity as criterion of performance of investigated banks to analyze the effect of above factors on existing competitive conditions in bank system of country.

## THEORETICAL BASICS AND REVIEW OF LITERATURE

In recent decades, based on relevant parameters on market system in state and private banks, banks management is encountered with threats as they were not important based on the state aids. Some issues as profitability and reduction of costs and improving quality of services by establishment of private banks and privatization of state banks are turned into important issue for activists of this industry as the safe past space is replaced with state supports of bank system to competitive space. In this competitive and risky space, the banks resist based on their capital against losses of insolvency of loans, unsuitable condition of market and some operational problems. A bank with adequate capital has much time to

investigate the problems and correct encountering with them. On the other hand, capital adequacy is a relative concept, it means that its suitable value is supported based on size and volume of bank activities. The big ratio of capital to assets means high covering of assets by capital or high capital adequacy against the probable losses.

## LOCAL STUDIES

Tayebe Ayini (2012) in a study evaluated the effective factors on capital adequacy ratio in Iranian banks. The results showed that liquidity and return on asset rate had positive and significant effect and bank size, loan share, return on equity rate, loss of loans and financial leverage had negative and significant association with capital adequacy. Mehdi Mehranfar (2012) in a study evaluated the bank performance and macro-economic factors in risk management. The results showed that liquidity, profitability and operating efficiency ratios and economic growth had positive effect and credit risk and inflation rate had negative effect on capital adequacy as management efficiency of bank risk. Molayi and Darabi (2011) in evaluation of the effect of inflation and liquidity and GDP on profitability of Melat bank found that there was a positive and direct association between liquidity and profitability of Melat bank. There is a significant association between GDP and profitability of Melat bank. Nori and Shokri (2010) in the study aimed to determine the relationship between capital adequacy with brokerage risk and financial performance of Iranian banks and found that averagely, capital adequacy ratio in state and private banks had inverse and significant effect on bankruptcy risk index. It had no significant effect on return on equity and profit margin.

## INTERNATIONAL STUDIES

In a study done by Omotola Awojobiand Roya Amel (2011), the performance of banking industry of Nigeria was evaluated with emphasis on effective factors on risk management of banks. The results of study showed that economic growth and inflation had positive and negative effect on capital ratio of Nigeria banks. Liquidity ratio, bank size and market risk had positive effect and credit risk had negative effect on capital ratio of Nigeria banks. Buyuksalvarci, Abdiglu, (2011) evaluated the effect of determinants of capital adequacy on financial condition of Turkey banks and showed that loans loss and return on assets had positive effect and loans and return on equity had negative effect and bank size, liquidity, deposits and net profit margin had no significant effect on capital adequacy ratio. The results of study of Mathuva (2009) as evaluation of the relationship between capital adequacy and cost-income ratio with profitability of commercial banks of Kenya showed positive relationship between profitability of bank and

ratio of core capital and risk-weighted capital ratio and negative relationship between profitability and paid fund ratio and cost-income ratio. Sarkaya, andOzcan (2007) determined capital structure in banking sector of Turkey and found that delay capital, portfolio risk, economic growth, capital mean levels and return on equity had positive association with capital adequacy ratio.

## STUDY METHOD

This study is descriptive and describes the relationship between variables by statistical tests. This study is correlation. The data analysis showed that to describe study variables, mean, standard error, variance, minimum and maximum and to show growth model, dispersion chart is used. In inferential statistics, to respond the study hypotheses and analysis of the relations between variables, panel data regression method is applied. The tests used in model detection are shown in details:

- To investigate stationarity, Hadri test is used.
- To detect the good model, F-Limer, chi-square and Hausman tests are applied.
- To investigate significance of regression coefficients, t-student test is used.
- To evaluate independence of errors of mode, Durbin-Watson statistics is used and to detect goodness of fit, coefficient of determination is used.

## STUDY HYPOTHESES

1. There is a significant association between liquidity and net profit and return on equity of banks.
2. There is a significant association between basic capital adequacy ratio to total risk-weighted assets and net profit and return on equity of banks.
3. There is a significant association between first Tier capital to total assets and net profit and return on equity of banks.
4. There is a significant association between first Tier capital to total risk-weighted assets and net profit and return on equity of banks.
5. There is a significant association between paid fund to total assets and net profit and return on equity of banks.

   The applied model for first hypothesis test

$$NET_{it} / ROE_{it} = \alpha_0 + \alpha_5 CSH_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

The applied model for second hypothesis test

$$NET_{it} / ROE_{it} = \alpha_0 + \alpha_4 TCA_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

The applied model for third hypothesis test

$$NET_{it} / ROE_{it} = \alpha_0 + \alpha_1 CCR_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

The applied model for fourth hypothesis test

$$NET_{it} / ROE_{it} = \alpha_0 + \alpha_3 TRC_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

The applied model for fifth hypothesis test

$$NET_{it} / ROE_{it} = \alpha_0 + \alpha_2 ECA_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

Main regression model of net profit (First panel):

$$NET_{it} = \alpha_0 + \alpha_1 CCR_{it} + \alpha_2 ECA_{it} + \alpha_3 TRC_{it} + \alpha_4 TCA_{it} + \alpha_5 CSH_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

Main regression of return on equity (second panel):

$$ROE_{it} = \alpha_0 + \alpha_1 CCR_{it} + \alpha_2 ECA_{it} + \alpha_3 TRC_{it} + \alpha_4 TCA_{it} + \alpha_5 CSH_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

Where, in these models:

$NEDT_{it}$ = Net profit of bank = $ROE_{it}$ = Return on equity $CSH_{it}$ = Bank liquidity

$TRC_{it}$ = The core capital (First Tier) to total risk weighted assets ratio

$CCR_{it}$ = The core capital (First Tier) to total assets ratio

$TCA_{it}$ = Total basic capital to total risk-weighted assets ratio (capital adequacy ratio)

$ECA_{it}$ = Paid fund to total assets ratio

$Al_{it}$ : Total assets to total debts ratio

$DE_{it}$ : Total debts to equity

$AG_{it}$ : Growth of bank assets

$BS_{it}$ = Bank size

$\varepsilon_{it}$ = Regression disturbance term

## STUDY VARIABLES AND THEIR CALCULATION METHOD

### Independent Variables

Liquidity, total basic capital to total risk-weighted assets (capital adequacy ratio), first Tier capital to total assets ratio, first Tier capital to total risk-weighted assets, paid fund of total assets, bank size, bank assets growth.

### Dependent Variables

Net profit and return on equity

### Control Variables

Assets to debt ratio, debt to equity ratio

**Table 1**
**Variables and measurement method**

| *Calculation method* | *Variable* | |
|---|---|---|
| Average liquidity of studied banks per year | Liquidity | Independent |
| Total basic capital/total risk-weighted assets | Total basic capital ratio to total risk-weighted assets (capital adequacy ratio) | |
| First Tier (core) capital/total risk-weighted assets | First Tier capital to total risk-weighted assets | |
| First Tier capital (core capital)/total assets | Ratio of first Tier capital to total assets | |
| Paid capital /total assets | Ratio of paid capital to total assets | |
| Is evaluated with natural logarithm of total assets | | |
| Difference of total assets of this year and previous year/total assets of past year | Growth of bank assets | |
| Based on financial statements of studied banks | Net profit | Dependent |
| Net profit/return on equity | Return on equity | Control |
| Total assets/total debts | Asset to debt ratio | |
| Total debts/total equity | Debt ratio to equity | |

*Study population and sampling method*

(a) **Equipment, books, journals and materials:** Collection of statistical data in this study is via statistics in TSE and central bank of Islamic Republic of Iran.

(b) **The location to have access to above facilities:** To achieve required information in the study, TSE organization and Central bank were visited.

## STUDY POPULATION AND SAMPLE

The study population is 15 active banks in stock market and OTC and the study duration is 2010-2013.

### Sampling Method

Sampling is selection of some people, events and objects of a defined population as the representative of population as their responses indicate group reflection as selected among them. Among 22 active banks in OTC and stock market, 15 banks were used as their financial statements are available in the study period and it includes about 68% of population.

### The Statistical Method of Study

The criterion, changes, minimum and maximum and direction of growth model can be used for dispersion chart. In inferential statistics, to respond the study hypotheses and analysis of relations between variables, regression method of panel data is applied.

## STUDY FINDINGS

### First Hypothesis

There is a significant association between liquidity and net profit and return on equity of stock owners of banks.

**First equation:** Regression of the relationship between liquidity and net profit

$$NET_{it} = \alpha_0 + \alpha_5 CSH_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

**Second equation:** Regression of the relationship between liquidity and return on equity:

$$ROE_{it} = \alpha_0 + \alpha_5 CSH_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

In the first hypothesis, there is no significant association at confidence interval 95% between liquidity and net profit after entering net profit in the first lag for non-auto correlation and net profit is mostly affected by previous year profit and there is no significant association between liquidity and return on equity.

- Math model of the first hypothesis is as follows:

$$NET_{it} = -9270520 + 0.138 CSH_{it} + 524707.9 BS_{it} + 629.37 AG_{it} + 5617.576 AL_{it} - 389.66 DE_{it} + 0.95 NET_{i(t-1)} + \varepsilon_{it}$$

– Math model of the second hypothesis is as follows:

$$ROE_{it} = -13.91 - 1.22 \times 10^{-6} CSH_{it} + 2.01 BS_{it} + 0.0013 AG_{it} - 0.026 AL_{it} + 0.0024 DE_{it} + \varepsilon_{it}$$

**Second Hypothesis**

There is a significant association between basic capital adequacy to total risk-weighted assets and net profit and return on equity of banks.

Equation (3) regression of the relationship betweenbasic capital adequacy to total risk-weighted assets and net profit:

$$\mathrm{NET_{it}} = \alpha_0 + \alpha_4 \mathrm{TCA_{it}} + \alpha_6 \mathrm{BS_{it}} + \alpha_7 \mathrm{AG_{it}} + \alpha_8 \mathrm{AL_{it}} + \alpha_9 \mathrm{DE_{it}} + \varepsilon_{it}$$

Equation 4, regression of the relationship between basic capital adequacy to total risk-weighted assets and return on equity:

$$ROE_{it} = \alpha_0 + \alpha_4 \mathrm{TCA_{it}} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

In second hypothesis, there is a significant association between basic capital adequacy to total risk-weighted assets and net profit, but there is no significant association between basic capital adequacy to total risk-weighted assets and equity return.

– Math model of third equation is as followings.

$$NET_{it} = -12367555 + 151551.3 TCA_{it} + 832033 BS_{it} - 989.21 AG_{it} - 41046.25 AL_{it} + 356.3026 DE_{it} + 0.955183 NET_{i(t-1)} + \varepsilon_{it}$$

- Math model of fourth equation is as followings.

$$ROE_{it} = 87.67 - 0.117 TCA_{it} - 3.670 BS_{it} + 0.017 AG_{it} - 0.034 AL_{it} + 0.0056 DE_{it} + \varepsilon_{it}$$

**Third Hypothesis**

There is a significant association between first Tier capital ratio to total assets and net profit and return on equity of banks share.

Equation 5, regression of the relationship between first Tier capital to total assets and net profit:

$$\mathrm{NET_{it}} = \alpha_0 + \alpha_1 \mathrm{CCR_{it}} + \alpha_6 \mathrm{BS_{it}} + \alpha_7 \mathrm{AG_{it}} + \alpha_8 \mathrm{AL_{it}} + \alpha_9 \mathrm{DE_{it}} + \varepsilon_{it}$$

Equation 6, regression of the relationship between first Tier capital to total assets and return on equity ratio.

$$ROE_{it} = \alpha_0 + \alpha_1 \mathrm{CCR_{it}} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

In third hypothesis, there is a significant association between first Tier capital total assets ratio, there is no significant relationship between first Tier capital ratio to total assets and return on equity.

- Math model of fifth equation is as followings:

$$NET_{it} = -16297124 + 150000.4CCR_{it} + 989518BS_{it} + 315.901AG_{it} - 25167.20AL_{it} + 254.601DE_{it} + 0.949NET_{i(t-1)} + \varepsilon_{it}$$

- Math model for sixth equation is as followings:

$$ROE_{it} = 79.817 - 0.129CCR_{it} - 3.423BS_{it} + 0.023AG_{it} - 0.016AL_{it} + 0.0058DE_{it} + \varepsilon_{it}$$

**Fourth Hypothesis**

There is a significant association between first Tier capital to total risk-weighted assets and net profit and return on equity of banks.

Seventh equation, regression of the relationship between first Tier capital to total risk-weighted assets and net profit :

$$\mathrm{NET_{it}} = \alpha_0 + \alpha_3 \mathrm{TRC_{it}} + \alpha_6 \mathrm{BS_{it}} + \alpha_7 \mathrm{AG_{it}} + \alpha_8 \mathrm{AL_{it}} + \alpha_9 \mathrm{DE_{it}} + \varepsilon_{it}$$

Equation 8, regression of the relationship between first Tier capital ratio to total assets of first Tier capital to total risk-weighted assets and return on equity:

$$ROE_{it} = \alpha_0 + \alpha_2 ECA_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

In fourth hypothesis, there is a significant association between first Tier capital to total risk-weighted assets and net profit, there is no significant association between first Tier capital to total risk-weighted assets ratio and return on equity.

- Math model of seventh equation is as followings:

$$NET_{it} = -11933107 + 78730.52ECA_{it} + 731667.1BS_{it} + 595.276AG_{it} - 11864.36AL_{it} - 87.723DE_{it} + 1.008NET_{i(t-1)} + \varepsilon_{it}$$

- Math model of equation 8 is as followings:

$$ROE_{it} = 29.259 - 0.276ECA_{it} - 0.557BS_{it} + 0.002AG_{it} + 0.012AL_{it} + 0.002DE_{it} + \varepsilon_{it}$$

**Fifth Hypothesis**

There is a significant association between paid capital to total assets and net profit and return on equity of share of banks.

Equation 9, regression of the relationship between paid capital to total assets and net profit:

$$\mathrm{NET_{it}} = \alpha_0 + \alpha_2 ECA_{it} + \alpha_6 \mathrm{BS_{it}} + \alpha_7 \mathrm{AG_{it}} + \alpha_8 \mathrm{AL_{it}} + \alpha_9 \mathrm{DE_{it}} + \varepsilon_{\mathrm{it}}$$

Equation 10, regression of the relationship between paid capital to total assets and return on equity:

$$ROE_{it} = \alpha_0 + \alpha_2 ECA_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

In fifth hypothesis, there is no significant association between paid capital to total assets and net profit and there is a significant association between paid capital to total assets and return on equity.

- Math model for ninth equation is as followings:

$$NET_{it} = -11933107 + 78730.52 ECA_{it} + 731667.1 BS_{it} + 595.276 AG_{it} - 11864.36 AL_{it} - 87.723 DE_{it} + 1.008 NET_{i(t-1)} + \varepsilon_{it}$$

- Math model for tenth equation is as followings:

$$ROE_{it} = 29.259 - 0.276 ECA_{it} - 0.557 BS_{it} + 0.002 AG_{it} + 0.012 AL_{it} + 0.002 DE_{it} + \varepsilon_{it}$$

Main first panel: There is a significant association between core capital (First Tier) to total assets, paid capital to total assets, first Tier capital ratio to total weighted risk assets, capital adequacy, bank liquidity and net profit of banks.

Regression equation of main first panel is as followings:

$$NET_{it} = \alpha_0 + \alpha_1 CCR_{it} + \alpha_2 ECA_{it} + \alpha_3 TRC_{it} + \alpha_4 TCA_{it} + \alpha_5 CSH_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

In the first main panel, the results show that core capital ratio (first Tier) total assets, paid capital to total assets ratio, bank liquidity, bank size on net profit of banks can be effective. The coefficient of determination shows that 91. 5% of changes of net profit of ban are explained by independent variables and Durbin-Watson statistics (2. 166) shows that there is no auto-correlation between model errors.

- Math model for the first main panel is as followings:

$$NET_{it} = -41027113 + 795451.1 CCR_{it} - 705331.2 ECA_{it} - 31552.07 TRC_{it} + 29598.85 TCA_{it} + 0.921 CSH_{it} + 2140051 BS_{it} - 701.897 AG_{it} + 4515.979 AL_{it} + 72.746 DE_{it} + \varepsilon_{it}$$

**Second Main Panel**

There is a significant association between main capital ratio (first Tier) to total assets, paid capital to total assets, first Tier capital to total risk weighted assets, capital adequacy ratio, bank liquidity and return on equity of banks.

Regression equation of second main panel is as followings:

$$ROE_{it} = \alpha_0 + \alpha_1 CCR_{it} + \alpha_2 ECA_{it} + \alpha_3 TRC_{it} + \alpha_4 TCA_{it} + \alpha_5 CSH_{it} + \alpha_6 BS_{it} + \alpha_7 AG_{it} + \alpha_8 AL_{it} + \alpha_9 DE_{it} + \varepsilon_{it}$$

In the second main panel, significance of variables of core capital (first Tier) to total assets, ratio of paid capital to total assets and debts ratio to equity show that effect of these factors on return on equity. Other model variables are not significant. The coefficient of determination shows that independent variables explain only 30. 8% of changes of return on equity of banks and Durbin-Watson value (2. 257) shows non-autocorrelation of errors.

- Math model of second main panel is as followings:

$$ROE_{it} = -9.538 + 2.602 CCR_{it} - 2.080 ECA_{it} - 0.168 TRC_{it} - 0.0422 TCA_{it} - (3.09 \times 10^{-7}) CSH_{it} + 1.487 BS_{it} - 0.000168 AG_{it} - 0.0914 AL_{it} + 0.0052 DE_{it} + \varepsilon_{it}$$

**Table 3**
**Summary of statistical results**

| *Hypotheses* | *Panel model type* | *Regression model* | *Significant variables independent* |
|---|---|---|---|
| First main | Fixed effect | $NET_{it} = -41027113 + 795451.1 CCR_{it} - 705331.2 ECA_{it} - 31552.07 TRC_{it} + 29598.85 TCA_{it} + 0.921 CSH_{it} + 2140051 BS_{it} - 701.897 AG_{it} + 4515.979 AL_{it} + 72.746 DE_{it} + \varepsilon_{it}$ | *CCR, ECA, CSH, BS* |
| Second main | Random effect | $ROE_{it} = -9.538 + 2.602 CCR_{it} - 2.080 ECA_{it} - 0.168 TRC_{it} - 0.0422 TCA_{it} - (3.09 \times 10^{-7}) CSH_{it} + 1.487 BS_{it} - 0.000168 AG_{it} - 0.0914 AL_{it} + 0.0052 DE_{it} + \varepsilon_{it}$ | *CCR, ECA, DE* |
| First subhypothesis | Random effect | $NET_{it} = 33271425 + 0.138 CSH_{it} + 524707.9 BS_{it} - 629.37 AG_{it} + 5617.576 AL_{it} - 389.66 DE_{it} + 0.95 NET_{i(t-1)} + \varepsilon_{it}$ | $NET_{(t-1)}$ |

*Cont. table 3*

| *Hypotheses* | *Panel model type* | *Regression model* | *Significant variables independent* |
|---|---|---|---|
| Second subhypothesis | Random effect | $ROE_{it} = -13.91 - 1.22\times10^{-6}CSH_{it} + 2.01BS_{it} + 0.0013AG_{it} - 0.026AL_{it} + 0.0024DE_{it} + \varepsilon_{it}$ | – |
| Third subhypothesis | Random effect | $NET_{it} = -12367555 + 151551.3TCA_{it} + 832033BS_{it} - 989.21AG_{it} - 41046.25AL_{it} - 356.3026DE_{it} + 0.955183NET_{i(t-1)} + \varepsilon_{it}$ | *TCA, BS,* $NET_{(t-1)}$ |
| Fourth subhypothesis | Fixed effect | $ROE_{it} = 87.67 - 0.117TCA_{it} - 3.670BS_{it} + 0.017AG_{it} - 0.034AL_{it} + 0.0056DE_{it} + \varepsilon_{it}$ | *DE* |
| Fifth subhypothesis | Random effect | $NET_{it} = -16297124 + 150000.4CCR_{it} - 989518BS_{it} + 315.901AG_{it} - 25167.20AL_{it} + 254.601DE_{it} + 0.949NET_{i(t-1)} + \varepsilon_{it}$ | CCR, BS, $NET_{(t-1)}$ |
| Sixth subhypothesis | Fixed effect | $ROE_{it} = 79.817 - 0.129CCR_{it} - 3.423BS_{it} + 0.023AG_{it} - 0.016AL_{it} + 0.0058DE_{it} + \varepsilon_{it}$ | *DE* |
| Seventh subhypothesis | Random effect | $NET_{it} = -14685044 + 129188.7TRC_{it} + 938465.2BS_{it} - 724.001AG_{it} - 32162.20AL_{it} + 268.253DE_{it} + 0.942NET_{i(t-1)} + \varepsilon_{it}$ | *TRC, BS,* $NET_{(t-1)}$ |
| Eighths subhypothesis | Fixed effect | $ROE_{it} = 91.104 - 0.117TRC_{it} - 3.889BS_{it} + 0.0143AG_{it} - 0.031AL_{it} + 0.0057DE_{it} + \varepsilon_{it}$ | *DE* |
| Ninth subhypothesis | Random effect | $NET_{it} = -11933107 + 78730.52ECA_{it} + 731667.1BS_{it} + 595.276AG_{it} - 11864.36AL_{it} - 87.723DE_{it} + 1.008NET_{i(t-1)} + \varepsilon_{it}$ | *BS,* $NET_{(t-1)}$ |
| Tenth subhypothesis | Random effect | $ROE_{it} = 29.259 - 0.276ECA_{it} - 0.557BS_{it} + 0.002AG_{it} + 0.012AL_{it} + 0.002DE_{it} + \varepsilon_{it}$ | – |

## DISCUSSION AND CONCLUSION

As the main problem of this study is investigation of the relationship between liquidity and capital adequacy with net profit and return on equity of shareholders of banks. To respond the study hypothesis and analysis of the relationship between variables, panel data regression is used.

Results of regression analysis show that:

In the first hypothesis, there is no significant association between liquidity and net profit after entering net profit in the first lag for non-auto correlation at confidence interval 95% and net profit is mostly affected by profit of previous year and there is no significant association between liquidity and return on equity. In the second hypothesis, there is a significant association between basic capital adequacy to total risk-weighted assets and net profit but there is no significant association between basic capital adequacy to total risk weighted assets and return on equity.

In the third hypothesis, there is a significant association between first Tier capital ratio to total assets and net profit. But there is no significant association between first Tier capital ratio to total assets and return on equity. In fourth hypothesis, there is a significant association between first Tier capital to total risk weighted assets and net profit but there is no significant association between first Tier capital to total risk weighted assets and return on equity of shareholders.

In the fifth hypothesis, there is no significant association between paid capital to total assets and net profit and there is no significant association between paid capital to total assets and return on equity.

In the first main panel, the results show that the factors of main capital (first Tier) to total assets, ratio of paid capital to total assets, bank liquidity, bank size are effective on net profit of banks. The coefficient of determination shows that 91. 5% of changes of net profit of bank are explained by independent variables of model and Durbin-Watson statistics (2.166) shows that there is no auto-correlation between errors of model. In the second main panel, significance of variables of core capital (First Tier) to total assets, paid capital to total assets and debts to equity show the effect of these factors on return on equity. Other variables of model are not significant. The coefficient of determination shows that independent variables only explain 30. 8% of changes of return on equity of banks and Durbin-Watson statistics (2. 257) shows non –autocorrelation of errors.

**Recommendations**

1. Findings of study not only help the capital adequacy and liquidity in bank system from theoretical aspects, they have practical results for academic and activists of bank system.
2. Under current economic conditions, it is proposed to managers of bank system that by increase of capital of banks on one hand improves capital adequacy and on the other hand increases loan giving in banks.

3. It is proposed to investors and analysts of stock market to consider capital adequacy in their decision making as standard index.
4. It is proposed to bank system managers to observe minimum standards in capital adequacy of banks and support the banks to improve this ratio.

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