**The Impact of Liquidity on Profitability in the Banking Sector of Bangladesh: A Study on the Commercial Banks in Bangladesh.**

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**ABSTRACT**

The goal of this research is to investigate the impact of liquidity on profitability in the commercial banking sector of Bangladesh. The key motive of the analysis is to establish the essence of the relationship and the intensity of the relationship between the variables as to the effect of liquidity on the profitability in the commercial banking sector. The observation is that almost all of the similar previous analyses have been driven primarily by the various financial conditions or have evaluated the effects in the short term and not in the normal course of operation. For this purpose, this analysis was aimed at defining the effect of banks’ liquidity on its profitability; with the normal course of business and in the medium term (10 years). A quantitative analysis is performed on a statistical sample of forty (40) commercial banks in Bangladesh. Secondary data is used to evaluate the performance of the last ten years (2009-2018) of the annual report of the commercial banks in Bangladesh with 206 bank years of data gathered for the consideration of all Bangladeshi commercial banks. In addition, the annual reports of these banks were checked and the main measures of profitability and liquidity were determined. Quantitative data of these banks is aggregated to provide a measures of these factors. Proposed variables are: Loan to Deposit Ratio (LDR), Deposit to Asset Ratio (DAR), Cash and Cash Equivalents to Deposit Ratio (CDR), Liquid Asset Ratio (LAR) and Current Ratio (CR) as liquidity representation, on the other hand, Return on Equity ( ROE) is the profitability representation. On the basis of those six variables, five hypotheses have been established those are used to assess the effect of liquidity on profitability. Pearson's co-efficient methodology of correlation and regression is used to determine the essence of the relationship and the degree of the interaction between dependent and independent variables. Following a correlation and regression analysis, it is observed that LDR, DAR and CDR had a substantial effect on the profitability measured as ROE, but the other two liquidity representatives (LAR and CR) proved insignificant. It can therefore be concluded that, in general, the impact of liquidity has a significant effect on the profitability in the commercial banking sector of Bangladesh. By rely on this report; Bangladeshi banks will be best positioned to keep a equality between its liquidity and profitability. As data from commercial banking sector was used in this analysis, these findings can’t be generalized to other sectors of the economy.

**KEY WARDS:** Liquidity, Profitability, ROE and Commercial Banks.

1. **INTRODUCTION**

In order to ensure extensive multinational business activities around the globe, regardless of its scale, it participate in financial management along with making use of financial accounting techniques to be a profitable company. The primary objective of any company is to maximize its level of profitability. (Paramasivan et al.,2016, p.1). One of the oldest and most important activities is that companies prosper from profit maximization. Most market models that participate in the procurement of products or services proceed with profit maximization (Levitt, 2015, p.1). The income of a company should be maximized and that most possibly successful transactions are made to achieve productivity in the managing of capital. (Obara et al., 2000; p. 8). Moreover, all decisions pertaining not only to acquisitions but also to funding and dividends are produced to maximize income (Borad, 2018, p. 1). So, there exist a straight relationship between profitability and the key organizational judgments that are subsequently created. This research would examine the effect of liquidity management decisions on the profitability of banks. The financial conditions that have arisen around the world in 2008 have demonstrated the degree to which liquidity will play a major role in banks' operations and this effect is not exactly on the banks' activities, but on the banking performance, there exist a direct influence (Lamberg et al., 2009).

The definition of accounting liquidity is explained as "the ability of an organization to pay off matured short-term obligation within or less than one year" (Shim et Siegel, 2000, p. 46-47) that is very much essential for the continued operation of the organization. When the liquidity ratio is greater than 1 it seems natural for a company when it is smaller than 1 it considers that the firms do not have enough capital to pay off short-term liabilities (Morrel, 2007, p. 62). Usually, a high liquidity ratio is an indication of strong financial strength (Chandra, 2001, p. 72), but some analyses indicate that too high a liquidity ratio often expresses the organization's mismanagement concerns (Matarazzo, 2003, p. 55), which indicates that companies have not made the optimal use of assets for profit maximization due to reduced profitability of existing assets compared to fixed assets. The proper balance is not to have excess or inadequate liquidity consistent with the optimal operating ratio of the bank (Bhunia, 2012, quoted in Ibe 2013, p. 1). Obtaining a rational trade-off between banks’ liquidity and its profitability is the key problem for liquid asset management (Nahum et al., 2012 , p. 1). In order to produce demand revenues to ensure financial efficiency, liquidity forces the removal of funds that can be spent. In comparison, a decrease of liquidity by a rise of working capital will result in a reduced rate of profitability if it could actually be spent (Raykov, 2017, p. 2). Banks are also faced with liquidity control dilemmas. For example, whether to select investment in profit-generating activities, which are heavy-yield bonds that can’t be volatile but offer greater returns, or yet to retain liquid asset by maintaining investment funds secure as liquid capital. Liquid money taken by the banks could lead to an opportunity cost or could end up as the basis for a big benefit maximization by the resilience it offers. The purpose of this analysis is to show how banks’ liquidity and profitability are associated in the ordinary course of business.

1. **LITERATURE REVIEW**

Prior studies have an essential role to play in the conduct of any form of study. In this way, by following the recommendations for such experiments, researchers will make their research more worthwhile. Some studies those are connected to this research are listed below:

The performance of the Nigerian bank during the period 2004 to 2012 is assessed by Hakimi and Zaghdoudi (2017). It evaluated the liquidity effect by using a generic method of timing, and the outcome reveals that there exist a strong link between the level of liquid assets retained and the banks performance in Nigeria. They signal that banks should boost their liquidity in order to sustain advanced output.

Interaction between profitability and liquidity on behalf of Pakistani commercial banks between 2008 and 2014 is being investigated by Khan and Ali (2016). The bank's statistical data for the past five years’has been used as secondary data usage. The gross profit margin and net profit margin ratios were supposed to be the indicator of profitability and the present ratio and the accelerated ratio were supposed to be the measure of liquidity. The mathematical study showed that there exist a strong positive association between liquid assets and the banks’ profitability. It is also revealed that banks should have retained a significant amount of their net assets in order to increase profitability.

Maqsood, et al .( 2016) also clarified the same opinion that bank liquidity has a major effect on the profitability of the banks. Secondary data were used in this analysis, which was taken from the annual reports of 8 separate banks between 2004 and 2015. The regression analysis and correlation methods were used in this research. Present Ratio (CR) and Cash Ratio (CASR) were used as liquidity substitutes as an independent variable whereas Return on Assets (ROA) was used to assess profitability as a dependent variable. The analysis concluded that there exist a substantial link between the liquid assets and the profitability of the banks.

The partnership between Nigerian banks' liquidity management and efficiency is being investigated by Bassy, et al .( 2016), which discussed the need for more reliable and productive liquidity management in order to sustain and effectively run banks. Usual least square approach used there and concluded that there is a substantial correlation between liquidity and performance measures.

Alshatti (2015 )conducted an analysis to create a liquidity management effect on the performance of commercial banks measures as profitability in Jordan. This analysis considers liquidity as an independent representative whereas return on assets (ROA) and return on equity (ROE) as a contingent variable to calculate the profitability of the bank. Financial data is analyzed using mathematical methods and a ratio analysis. The study concluded that the influence of expenditure and rapid ratio (QR) is positively associated with profitability when calculated by (ROE). Again, the effect of the capital ratio was positive when calculated by (ROA).

Financial data is analyzed using mathematical methods and ratio analysis. The study concluded that the effect of the expenditure and rapid ratio (QR) is positively associated with the profitability when calculated by (ROE). Once again, the effect of the capital ratio was positive when calculated by (ROA). The other independent delegates had little positive effect on the two profitability indicators (ROA) and (ROE). The researcher thus recommended that there is a need to draw on the liquidity of the banks.

Afia et al .( 2014) investigate the link of liquidity with its profitability between 2006 and 2011 for the banking sector in Bangladesh. But there was no major relationship between liquidity and profitability in this industry (government bank, Islamic bank, private commercial bank, and multinational bank). Only two vector liquidity (current ratio) and profitability (ROA) are used, so their estimates suffer from excluded variable bias.

The same view is also disclosed by Akter and Mahmud (2014), which indicate that there exist no substantial association between banks’ liquidity and profitability representing a sample of twelve banks in Bangladesh. There (ROA) represents an independent variable and the existing ratio ( CR) represents an independent variable. Similarly, Abdulla and Jahan (2014) have not built a clear link between the liquidity and profitability of private commercial banks through a time period of five years.

On the other hand, Junaidu et al (2014) found a favorable association between return on assets (ROA) and liquid assets (cash and bank balances) with limited liabilities and return on equity ( ROE) and cash and bank balances with total liabilities. They analyzed the effect of liquidity on the profitability of Nigerian banks over the period from 2003 to 2012. They also found that no substantial effect has existed between the liquidity and profitability among the in Nigeria. Wambu (2013) has taken 44 listed commercial banks in consideration and investigates the relationship between banks’ profitability and liquidity in Kenya over the period from 2008 to 2012. As a consequence, performance and liquidity have a strong positive relationship.

Arif (2012) estimated liquidity risk factors and reassessed their effect on twenty-two Pakistani banks over the period 2004-2009. This research reveals that liquidity control has a major effect on the viability of banks. Increased deposits contribute to a rise in the profitability of the bank, as there would be fewer borrowing costs to satisfy consumer demand and the distribution of non-performing loans and the liquidity deficit would adversely impact profitability. In the same way, Olagunju, et al . (2011) also reported that theprofitability of commercial banks has been impaired by its liquidity. There exist a negative correlation between the liquidity and performance of the banks and vice versa. The data from this analysis was obtained mainly from the management and financial statements of the selected banks and analyzed using the Pearson correlation methodology.

1. **METHODOLOGIES OF THE STUDY**

The objective of this research is to analyze the relationship between liquidity and profitability in the commercial banking sector in Bangladesh, and the study question is: "What is the impact of liquidity on profitability in the banking sector?

All the analytical methodologies are as follows:

Quantitative data selection, sample size, method of statistical analysis, independent and dependent variables, ratio models, quantitative data analysis and descriptive statistics: correlation evaluation, regression analysis.

**3.1 Quantitative Data Procurement**

Quantitative analysis is the right research design for the essence of the sample. Secondary data obtained from reported annual reports by commercial banks in Bangladesh. Annual data compiled on the website of individual banks.

For the purposes of driven this research objectives, a sample of forty (40) commercial banks are the representative sample of the total 62 schedule banks in Bangladesh. Only focusing on the banking industry this study is made up. Moreover, a time frame of ten (10) years from 2009 to 2018 is calculated for this analysis which can be suppose that, this samples will adopt a conclusion that can be generalized.

* 1. **Sample Size**

|  |  |
| --- | --- |
| Number of commercial banks available from 2009 to 2018 (40\*10) | **400** |
| Less : Non-availability of annual reports and data  | **194** |
| Total banking firm year of observations  | **206** |

* 1. **Method of Statistical Analysis**

For identifying the nature of impact of the independent representatives on dependent proxy and also for identifying the level of the relationship and the correlation between variable representatives again testing the hypotheses to accomplish these objectives, here used descriptive statistics, Pearson correlation test and Multiple linear regressions analysis.

**3.4 Independent and Dependent Variables:**

|  |  |
| --- | --- |
| Independent variables (liquidity representatives): 1. Loan to Deposit Ratio (LDR)
2. Deposit to Assets Ratio(DAR)
3. Cash and Cash Equivalents to Deposit Ratio (CDR)
4. Liquid Assets Ratio (LAR) and
5. Current Ratio (CR)
 | Dependent variables(profitability representatives):1. Return on Equity (ROE).
 |
|  |  |

Those variables are calculated through formulas over a mid-long range time period of 10-yearswhich are listed below:

**3.5 Formulas of the Ratios**

|  |  |
| --- | --- |
| Variables | Formula |
| Loan to Deposit Ratio (LDR) | Loan & Advance / Total Deposits  |
| Deposit to Assets Ratio (DAR) | Total Deposits / Total Assets |
| Cash and Cash Equivalents to Deposit Ratio (CDR) | Cash & equivalent / Total Deposits |
| Liquid Assets Ratio (LAR) | Cash & equivalent / Current liabilities |
| Current Ratio (CR) | Current Assets / Current Liability |
| Return on Equity (ROE) | Net Income/ Shareholders’ Equity |

**3.6 Quantitative Data Analysis**

After investigating data collected from published annual reports and for testing assumed hypotheses a methods of statistical analysis is used. For exploring data, Statistical Package for Social Sciences (SPSS) is used. Through SPSS, here compute descriptive statistics, correlation and also run regression model, analyze model summary, ANOVA, and coefficient value. The ANOVA analysis techniques are used to examine the study hypothesis. Analysis of descriptive statistics and correlations coefficient is presented prior to the main analysis. After that multiple regression analysis model is used. The key objective of these analyses is to determine the effects of banks’ liquidity on the performance of the banks measured as profitability.

**3.7 Descriptive statistics**

SPSS software version 16.0 is used here in order to give more understanding relating to the similar study variables which were being analyzed before. Statistical analysis formed descriptive statistics prior to another test accomplished using correlation and regression analysis. The mean and standard deviation for each variable are produced by that descriptive statistics.

**3.8 Correlation test regression analysis**

After descriptive statistics the correlation test regression analysis arrives prior to the start of regression analysis. The correlation coefficient was used to examine the link between dependent and independent representatives. Pearson correlations coefficients are tested for determining the level of the relationship exist between dependent and independent representatives.

**3.9 Multiple Regression Analysis**

To evaluate the objectives of this research which is to examine the impact of the liquidity on banks profitability, here is used multiple regression analysis for investigating the causal effects of the independent representatives such as (LDR, DAR, CDR, LAR and CR) with the dependent representative that is measured as (ROE). When the coefficient significance level is lower than the significant level) it is implausible that the coefficient occurred fortuitously and when the significance value exists above the significant level it states the vise-versa. (Saunders et al.,2009, p.461-462). Here in this study α=0.05.

The multiple regression model is given below:

**Y = α + β1 LDR + β2 DAR + β3 CDR + β4 LAR + β5 CR + ε**

Here:

**Y = Dependent Variable,**

**α = Constant,**

**β = Regression Coefficient,**

**ε = Error term**

After conducting the model of data for the commercial banks, this is supposed that it would be possible to examine the effects of banks’ liquidity on the profitability in the commercial banking sectors depending on the selected representatives.

1. **CONCEPTUAL FRAMEWORK AND HYPOTHESIS**

In order to supervise the durability of the financial condition of any organization liquidity is often viewed as shrewd monitoring measure. The continuous regulations from government to increase liquidity drive to keep up sustainable development of the banks. On the other hand in order to achieve wealth maximization, profitability is the major reasonable factor for which the shareholders and managers think about utmost. As the measurement of liquidity conducting by previous researches was excluded from the general determinants of bank’s profitability, investigating the relationship between liquidity and profitability was not enough in previous research. Because of the global financial crisis happened in 2008, made financial analyst to acknowledge the significance of liquidity management and the equality between liquidity and profitability of the banks. Here used the conceptual model to inspect the link between liquidity and profitability of the commercial banking sectors of Bangladesh in order to examine the quantitative part of this study.

The conceptual model is shown on figure 1

**Cash & Cash Equivalents to Deposit Ratio**

**Deposit to Assets Ratio**

**Liquid Assets Ratio**

**Current Ratio**

**Loan to Deposit Ratio**

**ROE**

**Figure 1:** Conceptual Model

**Table 1**

**Proposed Hypothesis**

|  |  |
| --- | --- |
|  | **Hypotheses** |
| **H1** | The Loan to Deposit Ratio (LDR) has significant impact on the Return on Equity (ROE). |
| **H2** | The Deposit to Assets Ratio (DAR) has significant impact on Return on Equity (ROE). |
| **H3** | The Cash & Cash Equivalents to Deposit Ratio (CDR) has significant impact on the Return on Equity (ROE). |
| **H4** | The Liquid Assets Ratio (LAR) has significant impact on the Return on Equity (ROE) |
| **H5** | The Current Ratio (CR) has significant impact on the Return on Equity (ROE) |

**4.1 Descriptive Statistics**

Investigation of the data accumulated through certain values, its central tendency, its range, divergence around the mean is very necessary prior to examination of sophisticated analyses. Hense, the descriptive statistics are conducted which is namely ROE, LDR, DAR, CDR, LAR & CR. In order to uphold the understanding relating to the constructs here determined their range, minimum, maximum, mean value, its standard deviation along with variance.

**Table 2**

The summarized statistics of the model forms is listed below:

| **Descriptive Statistics** |
| --- |
|  | **N** | **Range** | **Minimum** | **Maximum** | **Mean** | **Std. Deviation** | **Variance** |
| ROE | 206 | 53.69 | .06 | 53.75 | 15.4246 | 9.40116 | 88.382 |
| LDR | 206 | 74.16 | 24.10 | 98.26 | 79.9542 | 11.11407 | 123.523 |
| DAR | 206 | 94.82 | 1.01 | 95.83 | 76.2552 | 12.33197 | 152.078 |
| CDR | 206 | 78.39 | .61 | 79.00 | 11.4970 | 14.32628 | 205.242 |
| LAR | 206 | 28.61 | 1.00 | 29.61 | 9.0450 | 3.64582 | 13.292 |
| CR | 206 | 2.76 | .42 | 3.18 | 1.1803 | .30867 | .095 |
| Valid N (list wise) | 206 |  |  |  |  |  |  |

This values of the above set up from each single banks and a time period of mid-long range of ten years.

**Mean**

The Mean value of ROE is 15.42% which shows a good picture of banks performance on average. Where a general ROE in any distinct sector could be nearly 10% or less than it is as usual. The rate for technology or retail firm along with lesser financial transactions comparative to net income may more than or equal to 18% of ROE level. It is better to target of an ROE that is equivalent to or to some more than the average for the respective groups.

Accordingly, the mean of both LDR and DAR was quite closure which are 79.95 and 76.25. The mean LDR shows that on average there are 79.95% of deposit are given as loan by both conventional banks and shariah-compliant Islamic banks . Where Bangladesh Bank set a regulation to fix the ratio as 83.5% for conventional banks and IDR as 89% for shariah-compliant Islamic banks.

Whereas, the DAR mean is 76.25% which indicate that commercial banks on an average financed their assets nearly 76.25% of deposits through the mid-long range time periods of ten years.

The CDR states the level of liquidity a bank have to carried in its accounting relating to the depositors amount it maintain. The CDR mean is 11.50% shows that banks hold as much as 11.50% cash and cash equivalent as liquid assets compared to total deposit.

The LAR (liquid asset ratio) indicates a liquidity dimension of an organization's ability to pay off its short-term liabilities through cash and cash equivalents. An organization's total reserve of cash and near-cash securities is divided by the sum of its total current liabilities for achieving liquid asset ratio. Here the mean of LAR is 9.05% .

The mean CR (current ratio) 1.18 indicates a ratio of an organization’s current assets to its total current liabilities. This ratio is generally defined an assets that can be turned into cash within a year or less, and liabilities that can be paid off within a year or less.

**Standard Deviation**

Dispersion of data through the mean is calculated by the standard deviation measures (Cohen et al.,2007, 606). It is assumed that the dataset is normally distributed; the LDR standard deviation of 11.11% which is about seven times smaller. The DAR standard deviation representing 12.33% which is approximately six times smaller than the actual mean value. The standard deviation of CDR is nearly 14.33that is higher than for a mean value of 11.50 and indicates the severe variation in CDR of the commercial banks. On the other hand the standard deviation for the ratio LAR and CR are 3.65 and 0.31 consecutively. The significant differences reveal that most of the commercial banks are idiosyncratic to one another under several set of obligations, several market situations through some other regulations. The standard deviation of ROE is 9.40 which is also so high compare to the mean value of 15.42.

**4.2 Correlations**

The value of correlation coefficient always ranges between -1.0 which indicates a strong negative correlation and +1.0 which indicate a strong positive correlation. The values range nearly or close to zero indicates weak or no linear relationship.

**Table 3**

The linear correlations among the independent representatives of LDR, DAR, CDR, LAR and CR and dependent representative that is measured as (ROE) are given below:

**Table 3: Pearson’s Correlation**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | ***ROE*** | ***LDR*** | ***DAR*** | ***CDR*** | ***LAR*** | ***CR*** |
| ***ROE*** | PC\*\*\*Sig.( 2-tailed) | 1 |  |  |  |  |  |
| ***LDR*** | PCSig.( 2-tailed) | .450\*\*.000 | 1 |  |  |  |  |
| ***DAR*** | PCSig.( 2-tailed) | .365\*\*.000 | .291\*\*.000 | 1 |  |  |  |
| ***CDR*** | PCSig.( 2-tailed) | -.003.965 | -.339\*\*.000 | -.135.053 | 1 |  |  |
| ***LAR*** | PCSig.( 2-tailed) | .153\*.028 | .117.094 | .043.539 | .037.597 | 1 |  |
| ***CR*** | PCSig.( 2-tailed) | -.039.581 | -.182\*\*.009 | -.184\*\*.008 | .035.619 | .046.515 | 1 |

\*\*\* (PC) = Pearson Correlation

\*\* Significant correlation at the 0.01 level (2-tailed).

\*Significant correlation at the 0.05 level (2-tailed).

**4.3 Regression Analysis: ROE and Liquidity Proxies**

Regression analysis was carried out for investigating the effects of liquidity on banks profitability. This analysis is based on return on equity (ROE) as the dependent representative whereas LDR, DAR, CDR, LAR and CR were acted as independent representatives.

**Table 4**

The model summary of the regression analysis is:

| **Model Summary** |
| --- |
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
| **1** | **.551a** | **.304** | **.287** | **7.94053** |
| a. Predictors: (Constant), LDR, DAR, CDR, LAR and CR |

Here the value of R-squared is 0.304 which express that about 30.4 % discrepancies in explain by the independent variables which are (LDR, DAR, CDR, LAR and CR) in the model. In this model summary the adjusted R square is 28.7% which indicate that 28.7% of the variation of return on equity (ROE) is caused by independent representatives those are (LDR, DAR, CDR, LAR and CR).

| **Table 5**ANOVA table of the regression analysis is shown below:**ANOVAb** |
| --- |
| Model | Sum of Squares | df | Mean Square | F | Sig. |
| **1** | **Regression** | **5507.866** | **5** | **1101.573** | **17.471** | **.000a** |
| **Residual** | **12610.396** | **200** | **63.052** |  |  |
| **Total** | **18118.262** | **205** |  |  |  |
| a. Predictors: (Constant), CR, CDR, LR, DAR, LDR |  |  |
| b. Dependent Variable: ROE |  |  |  |  |

ANOVA test is essential in constructing whether the judgments would have been derived at through a sampling error. If the regression line differs from zero, the ANOVA test also helps to conclude. When regression line differs from 0 (zero), it indicate that there is no sampling error which can affect the findings.

It can be seen from ANOVA table that, at 95% confidence level and at 0.05 of significance level, the model is significant as the value of F which is 17.471 is greater than the Sig. value.

**Table 6: Regression**

**Coefficients**

| **Model** | **Unstandardized Coefficients** | **Standardized Coefficients** | **t** | **Sig.** |
| --- | --- | --- | --- | --- |
| **B** | **Std. Error** | **Beta** |
| 1 | **(Constant)** | -36.011 | 6.101 |  | -5.903 | .000 |
| **LDR** | .368 | .056 | **.435** | 6.567 | .000 |
| **DAR** | .208 | .048 | **.273** | 4.383 | .000 |
| **CDR** | .115 | .041 | **.175** | 2.785 | .006 |
| **LAR** | .207 | .154 | **.080** | 1.343 | .181 |
| **CR** | 2.473 | 1.852 | **.081** | 1.335 | .183 |
| Dependent Variable:ROE |  |  |  |  |  |  |

The regression model coefficients shall show the regression coefficients along with the intercept and the importance of the standardized and unstandardized coefficients. standardized beta coefficient determined the unit change in the standard deviation of the return on equity (ROE) for each unit change in the standard deviation of the independent representatives those are LDR, DAR, CDR, LAR and CR. This shows that with each unit shift from LDR, DAR, CDR, LAR and CR standard deviation, ROE would shift by 43.5 percent, 27.3 percent, 17.5 percent, 8.00 percent and 8.1 percent respectively.

Where the confidence level is 95%, the meaning norm is a p-value that is less than 0.05. It can also be inferred that RAO-dependent LDR, DAR and CDR have a substantial effect on profitability. The other two independent delegates (LAR and CR) have an insignificant influence as the Sig. The meaning of LAR and CDR is greater than 0.05.

**Table 7:**

**Revised Hypotheses**

|  |  |  |  |
| --- | --- | --- | --- |
| **Abbreviation** | **Hypotheses** | **Significance** | **Verdict** |
| **H1** | The LDR (Loan Deposit Ratio)has significant impact on the ROE | .000 | Supported |
| **H2** | The DAR (Deposit Assets Ratio) has significant impact on the ROE | .000 | Supported |
| **H3** | The CDR (Cash & Cash equivalents to Deposit Ratio )has significant impact onROE | .006 | Supported |
| **H4** | The LAR (Liquid Asset Ratio) hassignificant impact on the ROE | .181 | Not Supported |
| **H5** | The CR (Current Ratio)has significant impact on the ROE | .183 | Not Supported |

**Determining the coefficients values of the research models**

The regression model is given below:

**Y = α + β1LDR + β2DAR + β3CDR + β4LAR + β5 CR + ε**

The regression equations will be written based on the coefficients values is given below :

**Y = -5.903 + 6.567**LDR**+ 4.383**DAR **+ 2.785** CDR **+ 1.343** LAR **+ 1.335**CR **+ ε**

Above equation statesthrough the all proposed liquidity ratios the profitability of the banking industryis positively affected as measured by return on equity (ROE).

1. **Hypotheses Analysis**

After testing the correlations and regression analysis by focusing on the model constructs where the independent variables are (LDR, DAR, CDR, LAR and CR) and the depended variable is the return on equity (ROE) where the main motive of this research is to investigate the effects of liquidity on profitability in the commercial banking sector of Bangladesh. Statistic analytical discussion is hold on to analyze the proposed hypotheses in order to present and evaluate the key research purpose.

**➢First Hypothesis**

**H1: The loan to deposit ratio (LDR) has significant impact on the return on equity (ROE)**

The result of the first hypothesis shows that it is supported by the regression analysis. The loan to deposit ratio which acts one of the independent variables is significant in relation to the dependent variable as return on equity. Therefore, the study clearly shows that hypothesis of loans to deposits ratio has an impact on return on equity (ROE) is accepted. This acceptance states that if a bank raises its loan level compared to its deposits then it will significantly impact on its profitability. Hence, the linear correlation between loan to deposit ratio and return on equity has a positive relationship that indicates if one is increasing then the other will also be increase and vice-versa.

This result indicates that the LDR ratio has statistical significance for the impact of the profitability as measured by ROE. The possible reason is that when the level of loan is raised it would also be supposed to increase the level of interest revenue received by the bank (Ducy et al., 2013, p. 7). Cause the interest revenue from loans offer a bank higher return in relation to any other investment. This reduction in bank’s deposits level cause to lose the source of cheap funds which could be utilized the emergence liquidity need along with the cheaper source of investments. When any bank faces any liquidity crisis or has to meet the reserve requirements then it has to compel to borrow generally from central bank or from other commercial banks. In relating to the monetary policy decisions usually central bank has set the benchmark rate of these short-term loans taken by the bank to meet its fund crisis (Elliot, 2014, p. 5 & 16). That benchmark rate sometimes has seen a unusual increment in the period of the financial emergence and therefore bank has to pay severe interest rates in order to fulfill liquid assets demand (Illes et al., 2015, p. 1). Hence, the bank’s cost of fund to meet liquidity demand would become higher than the interest revenue earned through giving loans and that outcome shall be on return calculated on the depositors’ funds and total average asset.

But here, the calculated average mean Loan Deposit Ratio is 79.95% for the banking sectors in Bangladesh which is below the declared LDR by Bangladesh Bank. That’s why; here remain a positive correlation between loan to deposits ratio and return on equity.

**➢Second Hypothesis**

**H2: The deposit to asset ratio has significant impact on the return on equity**

The result of the second hypothesis shows that it is supported by the regression analysis. It indicates that there exists a statistically significant relationship between the liquidity representatives of deposit assets ratio (DAR) to the profitability representative of return on equity (ROE). In consequence, here exist a medium positive linear correlation between deposit assets ratio and return on equity that indicates that those dependent and independent representatives suppose to move in the similar way. Hence, the deposits to assets ratios that a bank has to maintain have significantly impact on its profitability as measured by ROE. As there exist a strong positive linear relationship which concluded that an increase in the level of deposits will also bring an output of an improvement of return on equity.

This outcome is a result of the bank’s ability to invest in distinct financial portfolio where the rate of return is greater than the interest pain on the corresponding deposits. This situation has given an opportunity for commercial banks to earn more interest revenue on provided loans and other debt facilities that have spread out to other customers.

**➢Third Hypothesis**

**H3 : The cash & cash equivalents to deposit ratio has significant impact on the return on equity**

Through regression analysis, the third hypothesis is accepted. The **cash & cash equivalents to deposit ratio** which acts one of the independent variables is statistically significant in relation to the dependent variable as return on equity. Hence, the cash & cash equivalents to deposits ratio has significant impact on return on equity is supported by the regression analysis. The result indicates that, the performance of the banks is also supposed to have significant impact if commercial banks raise their level of liquidity in relation to the enhancement of cash and cash equivalents.

**➢Fourth Hypothesis**

**H4: The liquid asset ratio has significant impact on the return on equity**

The result of the forth hypothesis indicate that it is not supported by the regression analysis. The variable of the liquid assets ratio is insignificant in relation to the return on equity. Therefore, the study shows that hypothesis of the liquid asset to current liability ratio has no significant impact on the return on equity and so the proposed hypothesis is rejected. This indicate that if a bank raise its liquid assets ratio comparing to its current liability then it can’t make any significant affect on its profitability. There is a positive linear relationship between liquid assets ratio and return on equity that bring a result that if one variable is increasing the other variables will also be increased and vice-versa and any emergence of inverse relationship is resulted from other factors in the economy. The final conclusion regarding liquid assets ratio is statistically insignificant as compared to ROE.

Through this study, it is found that though LAR has weak positive correlation with ROE but has no significant impact on ROE. This is possibly because the mean average LAR is only 9.05%. The reason for positive correlation might be that the individual investors find it save to have quick liquid asset in the hand of banks though there exist no significant relationship between LAR and RO

**➢Fifth Hypothesis**

**H5: The current ratio has significant impact on the return on equity**

Through regression analysis, the result of the fifth hypothesis is not supported. The current ratio which acts one of the independent variables is statistically insignificant in relation to the dependent variable as return on equity. The hypothesis that the current ratio has significant impact on the return on equity is not selected based on the study data. Moreover, a weak negative linear correlation exist between current ratio and return on equity which indicate that when one variable moves in one direction the other will move in the opposite direction. The regression analysis conducted provided that with results where there is no significant relationship between ROE and CR and the correlation coefficient shows that there is a weak positive correlation between ROE and CR. The possible reason for the nonimpact on the profitability through current ratio is that different business have mark different rate for their standards ratio and that’s why it can’t lead to productive insight.

**Conclusion and Recommendations**

**6.1 Conclusion**

The key motive of this analysis is to describe the effect of liquidity on profitability in Bangladesh's banking sector. In line with this, the general research issue was to assess the effect of liquidity on the viability of the banking sector. Here, the research period is from 2009 to 2018, which is the period since the 2008 global financial crisis, provided the focus on the liquidity and profitability tradeoff of the banks. However, this study showed that, in that time period, banks had made investments in loans and other liquid assets in comparison to the need for banks to retain sound liquidity management. While there is no serious effect of the financial crisis in Bangladesh like every other major economy nation, the influence of the crisis has gradually decreased as financial markets and economies try to sustain tighter control. That's why; the profitability of the banks shows varying consequences for stricter supervision, battling with each other, and for the economic slowdown stemming from the economic meltdown. Banks have significant portfolios in government securities to mitigate their liquidity risks, which are also described in this study period.

**6.2 Recommendations**

Liquidity management is one of the bank's main goals as it has a larger impact on profitability. It may also be advised that banks spend their excess liquid volume, which stays idle after compliance with regulatory and consumer requirements. It is important for banks to invest in portfolios in order to benefit from the time value of the surplus capital available on their hands and to become more profitable. In order to ensure sufficient liquidity, a general liquidity management system should be implemented by Bangladesh 's commercial banks in order to carry out their work effectively. Commercial banks can use scientific methods to diagnose the strengths and limitations of the liquidity situation, especially in unexpected situations that could be uncovered by banks, and banks can also carry out an observational analysis of the pace of liquidity development in order to determine the capacity of banks to manage sources and exercise funds.

Any guidelines are focused on the rigorous appraisal of the results of the report. It is hoped that these guidelines would help to mitigate the problems of liquidity management and profitability in Bangladesh's banking sector, although they are not entirely eradicated.

* Commercial banks should not only rely on the principle of profit maximization, but should also rely on steps to ensure effective liquidity control, considering the high importance of liquidity management in the profitability of banks. These interventions can aim to minimize or remove cases of unnecessary and insufficient liquidity as they have detrimental consequences.
* Since the sustainability of commercial banks relies on liquidity control and profitability, and thus, instead of retaining unnecessary empty liquid volumes as a provision for unexpected withdrawal requirements from depositors, banks should find it viable to take the required steps to satisfy those sudden requirements ( e.g. short-term funding and bill discounting).
* A consumer portal may be set up by commercial banks, where their clients/ depositors can hear about the various deposit conditions and the operating specifications of each of them. This method makes it easier for banks to measure the liquidity amount to be retained while customers run some of the deposits as needed.

**6.3 Practical Contributions**

This research study has practical significance, especially for the commercial banking sector in Bangladesh. In order to ensure sufficient liquidity, a general liquidity management system should be implemented by Bangladesh’s commercial banks in order to carry out their work effectively. Efficient cash control may be a distinction between continuing operation and insolvency. In the run-up to the 2008 financial crisis, most banks stressed profitability above other new facets of their industries , e.g. liquidity management. This study shows that successful liquidity management activities have an impact on profitability; hence, banks need not only rely on the principle of benefit maximization by compromising the current state of concern. Commercial banks may take advantage of this by striking the correct combination of liquidity and profitability.

**6.4 Suggestions for Further Research**

This research focuses on the goal of assessing the effect of liquidity on the profitability of banks. As a result, further analysis on liquidity control and viability remains feasible. It may become attractive if a further analysis is focused on concentrating on all smaller banking operations carried out by small banking organizations and for longer periods of time. It would also be attractive to expand this research to other industry segments based on a longer span of research in order to take into account more detailed causal impact of liquidity control on profitability. Finally, it will be best to carry out a related analysis using a qualitative or hybrid approach in order to clarify the connection between banks’ level of liquidity and its profitability.

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