**Impacts of liquidity risk on the financial performance:**

**A study on the commercial banks of Bangladesh**

**Abstract:**

As liquidity crisis is affecting the banking industry of Bangladesh, the study aims to analyze the impact of liquidity risk on financial performance of selected commercial banks in Bangladesh. The study applied a descriptive research design and targeting 20 commercial banks in Bangladesh, all with data spanning five years between 2014 to 2018 with secondary data by employing panel regression analysis model. Nine factors affecting financial performance of selected commercial banks in Bangladesh were selected and analyzed. In the study Return on asset (ROA) and Return on equity (ROE) are used as Bank performance measurement tools and Non-Performing loan ratio (NPLR), Capital Adequacy ratio (CAR), Capital to total asset ratio (CTAR), Loan to deposit ratio (LTD), Loan to total asset ratio (LTA), Deposit to asset ratio (DTA), Cash to deposit ratio (CDR), Liquidity Coverage ratio (LCR) and Net Stable Funding ratio (NSFR) are used as liquidity risk indicators. The result of panel data regression analysis showed that non-performing loan ratio (NPLR), Capital Adequacy ratio (CAR), Loan to deposit ratio (LTD) and Deposit to asset ratio (DTA) had negative and statistically significant impact on financial performance of selected commercial banks in Bangladesh. Whereas Loan to total asset ratio (LTA), Capital to total asset ratio (CTAR) and Liquidity Coverage ratio (LCR) had positive and statistically significant impact on financial performance of selected commercial banks in Bangladesh. However, Cash to deposit ratio (CDR) and Net Stable funding ratio (NSFR) had no statistically significant impact on financial performance of selected commercial banks in Bangladesh for the tested period. Therefore, the liquidity risk is negatively affecting the financial performance of selected commercial banks in Bangladesh.

**Keywords**: Liquidity risk, Financial performance, and Commercial Bank

**1. INTRODUCTION**

**1.1 Title of the study**

*“The Impact of Liquidity Risk on Financial Performance of Selected Commercial Banks in Bangladesh”*

**1.2 Background of the Study**

The study is conducted to find out how the liquidity risk affects financial performance of selected commercial banks in Bangladesh. Financial performance may be a company’s ability to get new resources, from regular operation over a given amount of time and it's gauged by profit and money from the operation. A bank is a financial intermediary whose core activities are to collect deposit from saver to provide loans to borrower. Banking business has done crucial activities for the world economy. Banks collects surplus fund from saver and allocate to those both people and companies with a deficit of funds (borrower) in doing this, they channel funds from saver to borrower, thereby increasing economic efficiency by promoting a better allocation of resource. However, this fundamental role of banks in the maturity transformation of short-term deposits into long term loans make banks inherently vulnerable to liquidity risk, both of an institution specific nature and that which affects markets (Barbara, Claudia, & Philip, 2015).

Liquidity in banking is a key factor. Barbara *et al*., (2015) define liquidity asset as an asset that can be turned in to cash quickly without capital loss or interest penalty. When a bank holding insufficient liquid asset and unable to meet its short-term financial obligations without incurring high cost this is called liquidity risk. Liquidity risk is generated in the balance sheet by a mismatch between the size and maturity of asset and liability (Barbara *et.al.,*2015). Barbara *et.al.,* (2015) argue that there is a trade-off between liquidity and profitability, as the more liquid the asset, the lower rate of return. Instead of holding liquid fund, a bank could make more profitable loan. Despite the cost, however, the holding of liquid asset is necessary as it; reassure creditor that the bank is safe and able to meet its liability, signal to the market that the bank is prudent and well managed, ensure that all lending commitment can be meet, avoid forced sale of the bank asset, avoid having to pay excessive borrowing cost in the interbank market and central bank borrowing.

According to Rashid (2019) in Bangladesh, sometimes there exists access liquidity while sometimes there is liquidity crisis. The ongoing trend in most of the banks is worse liquidity crisis and crowding out effect because of government's excessive borrowings and bad loan given to the businessmen without much considering their ability to generate enough income to pay back the necessary installments. Various risks are creating barriers in their way of operation. For example: systematic risk and unsystematic risk, this study is focusing on one of the unsystematic risks that is liquidity risk and its effect on the profitability. In the period of 2007 to 2009 this sector faced financial crisis. At that time, a deep concern among the bank regulators raised. So, they introduced Basel 3 accord that aim to keep more reserves in form of liquid assets for banks to face future financial crisis (BCBS, 2009). Basel Committee made various new rules regarding different type of risks. Liquidity risk is one of them. Recently, our banking sector is facing liquidity crisis as demand for loan from private sector is facing an upward trend (Rashid, 2019). Excess liquidity is bad for a company whereas liquidity crisis is more dangerous. Financial transaction mainly takes place through banks, so liquidity risk damages their reputation as well as customer faith towards which eventually leads of bank failure. Liquidity risk can be caused for various reasons. First reason is that inefficiency of banks to cope up with decreasing of liabilities and increase of asset. Another reason is the imbalance between cash inflows and outflows as well as sudden liquidity needs from contingency conditions (Ahmad, & Jan, 2017). Moreover, Liquidity problem can damage the good will of banks and lack of liquidity will make bank insolvent and bankrupt. Liquidity risk has both positive and negative relationship in the banking industry. Liquidity crisis has now become a serious issue for both developed and developing countries (BCBS, 2009). As a developing country Bangladesh has almost 60 Governments, Commercial and Islamic banks (Rahman, & Banna, 2015). Bearing all these things in mind, the study is done to see if liquidity risk is positively or negatively, or no effect related to the financial performance of Selected Commercial banks in Bangladesh.

**1.3 Statement of the Problem**

Several studies have evaluated the effect of liquidity risk on financial performance of commercial banks. Lartey (2013) found a weak positive relationship between the liquidity risk and the profitability of Ghana’s listed banks. However, Bourke (1989), Kosmidou and Pasiouras (2005); Chen, Kao and Yeh (2009) found that liquidity risk had a positive and significant effect on financial performance of commercial banks. Whereas Li (2007) concluded that the effect of liquidity risk on profitability is mixed and not significant. On the other hand, Maaka (2013), Alzorqan (2014) and Kindu (2019) studied the relationship between bank liquidity risks on banks performance and found a significant negative relationship between them. Graham and Bordeleau (2010) in a study of influence of liquidity risk on bank profitability and suggested that a nonlinear relationship exists between liquidity risk and profitability, whereby profitability is improved for banks that hold some liquid assets, however, there is a point beyond which holding further liquid assets diminishes a bank’s profitability. Muteti (2014) noted that the effect of liquidity risk on financial performance was inconclusive. Based on the reviewed studies, the empirical evidence on the effect of liquidity risk on financial performance is mixed. However, Commercial banks manage liquidity risk by managing certain aspects of banks performance such as customer deposits, loans; capital adequacy and asset quality (Ogilo & Mugenya, 2015).

Therefore, the impact of liquidity risk on financial performance of commercial banks cannot be regarded as conclusive. Thus, it can be concluded that prior studies on bank’s liquidity risk and financial performance still leave enormous gaps as their studies have not reached a compromised conclusion on the issue. Therefore, this study attempted to fill this research gap by using a distinct viewpoint to determine the impact of liquidity risk on the financial performance of selected commercial banks in Bangladesh; by examining how the factors that influence banks liquidity risk affect financial performance of Selected Commercial Banks in Bangladesh as there is not enough research on this subject. Moreover, the contradiction between the findings from the various studies and the lack of focus on all deposit taking financial institutions provided a justification for this study. So, there is a need for more knowledge about this relationship to help both bankers and investors to analyze the risk.

**1.4 Research Questions**

In line with the general objectives the paper has tried to answer the following research questions:

**RQ1:** Is there any impact of Liquidity risk on the financial performance of Selected Commercial Banks in Bangladesh?

**RQ2:** Is there any significant relationship between NPLR, CAR, CTAR, LTD, LTA, DTA, CDR, LCR and NSFR on financial performance measured by ROA?

**RQ3:** Is there any significant relationship between NPLR, CAR, CTAR, LTD, LTA DTA, CDR, LCR and NSFR on financial performance measured by ROE?

**1.5 Research Objectives**

**1.5.1 Broad Objective**

The main objective of the study is to examine how liquidity risk affects financial performance of Selected Commercial Banks in Bangladesh.

**1.5.2 Specific Objectives**

The specific objectives are:

* To determine the impact of liquidity risk on financial performance of Selected Commercial Banks in Bangladesh.
* To find the relationship between NPLR, CAR, CTAR, LTD, LTA, DTA, CDR, LCR and NSFR with financial performance measured by ROA.
* To find the relationship between NPLR, CAR, CTAR, LTD, LTA, DTA, CDR, LCR and NSFR with financial performance measured by ROE.

**1.6 Significance of the study**

The study beyond serving the academic purpose it will have the following contributions. The study will promote the existing knowledge in the area of understanding liquidity risk, its determinants and how it affects financial performance of Commercial Banks in Bangladesh. The other benefit of the study is to create alertness of the bank officials in order to boost their bank‘s profitability. By understanding the factors that have a significant effect on liquidity risk bank managers will be able to develop better liquidity risk management policies. Further they will be able to gainfully manage those factors with a view to improve the financial performance of the banks they manage. Regulators and supervisors of commercial banks will be able to develop better policies that enhance stability and resilient banking sector. Therefore, the major beneficiaries from this study are each commercial bank, regulatory bodies, and the academic staff of the country and will contribute to the well-being of the financial sector of the economy and the society as a whole in the country and for other researchers to gain knowledge about the impact of liquidity risk on financial performance of commercial banks. Moreover, it will serve as a reference material for anyone who will undertake a further study on the same or related topic.

**1.7 Scope of the Study**

The main focus of the study is to examine the Impact of Liquidity Risk on Financial Performance for 20 Commercial banks in Bangladesh from the year 2014 to 2018 in the sample. In this report it has been tried to cover the impact of different liquidity risk measure variables that affect the financial performance of selected commercial banks in Bangladesh. However, this study seeks to associate more liquidity risk variables to gather knowledge, if there is any significant relationship with the profitability of the banks. Finally, through the means of this study the management authority can gain more insights on this topic according to Bangladesh context and establish a suitable liquidity risk policy that will develop the performance and competitiveness of the banks.

**2. LITERATURE REVIEW**

**2.1 Introduction**

This chapter represents literature review of the preview’s studies done on the topic. Here we are going to discuss the research done by different scholars regarding the impact of liquidity risk on financial performance of Commercial banks. Then the related empirical studies and a conceptual framework with discussion of research variables followed by summary of literature and finally research gaps. A total of eighteen hypotheses have been formulated with respect to the research objectives. The framework will then be used as a guide for designing the research methodology, which will be discussed in the next chapter.

**2.2 Liquidity Risk**

Liquidity is the potential of the financial service companies to fulfill the client’s cash requirements and make available advances in the forms of overdrafts and financial loans. Liquidity risk arises from maturity mismatches where liabilities have a shorter tenor than assets. A sudden rise in the demand of borrowers above the expected level can lead to a shortage of cash or liquid marketable assets (Oldfield & Santomero, 1995). The liquidity crisis in a banking institution could lead to insolvency and bank runs. Consequently, minimizing the liquidity risk is one of the most important aspects of asset and liability management of banks. Liquidity risk got the substantial attention of risk specialists and regulatory bodies in recent years. It has a devastating effect on financial institutions profitability (Diamond & Rajan, 2005). It also adversely affects the overall earnings, capital adequacy, and assets base of the financial institutions. Therefore, it becomes the top priority of a bank’s management to ensure the availability of sufficient funds to meet future demands of providers and borrowers, at reasonable costs. Muranaga, and Ohsawa, (2005) suggested that there are two key dimensions of liquidity risk: (1) liquidating the assets as and when required; and (2) at a fair market value. Banks face liquidity risk if they are not liquidating their assets at a reasonable price. The price fetching remains precarious due to frazzled sales conditions, while liquidating any of the bank’s assets urgently. This may result in losses and a significant reduction in earnings. According to Edem (2017) when cash sources surpass cash consumption, it makes liquid treasury and when the cash consumption surpass money sources, it makes liquidity shortage. This could create a bank incapable to diminish the debts or to gather reserves to expand the resources. The recent economic quandary, there is a common knowledge that banks had not completely acknowledged the significance of liquidity threat management and the indication of a certain threat for the bank and the more extensive financial practices. As such, policymakers have recommended that bank ought to keep more liquid resources than within the past, and this will offer assistance self-insure against manageable liquidity or financing challenges (Chege *at el.,* 2017).

**2.3 Review of Related Empirical Studies-** Bank liquidity risk and financial performance

Liquidity versus Profitability is a common topic in the finance literature. However, past research evidence contradictory findings, as some researchers find negative and some researchers find positive relationships, while others find mixed relationship between the liquidity risk and financial performance of commercial banks. Therefore, it is very important to identify the effects of the liquidity risk on different types of performance indicators of the banks when taking decisions in order to minimize the risk and maximize the profitability of the banks.

There are numerous studies on the impact of liquidity risk on financial performance of banks, such as (Bourke, 1989; Eichengreen and Gibson, 2001; Kosmidou *et al.,* 2005; Olagunju *et al.,* 2012), have explained that liquidity risk has a positive impact on bank performance. However, other studies argued that there is a negative impact between liquidity risk with bank performance and did not support this concept. In line with their results Guru *et al.,* (2002) and Goddard *et al.,* (2004) also found evidence of a negative liquidity-profitability relationship for European banks in the late 1980s and mid-1990s, respectively.

Worku (2006) argued that liquidity has an impact on the performance of commercial banks in Ethiopia by analyzing a negative relation between loan to deposit ratio and Return on equity. Worku used different ratios when analyzing liquidity effect on banks performance and these ratios were liquid asset to net profit, liquid asset to total assets, net loans to net deposits, interest income to net deposit and interest income to interest expense (Worku, 2006).

Athanasoglou *et al.*, (2006) discovered that liquidity risk, measured by the proportion of loans to total assets, has no impact on Return on asset and Return on equity by analyzing an unbalanced panel dataset of South Eastern European credit institutions over the period 1998–2002.

Bordeleau *et al.,* (2009) assess the impact of liquidity on bank profitability for 55 US banks and 10 Canadian banks between the periods of 1997 to 2009. The study employed quantitative measures to assess the impact of liquidity on bank profitability. The study suggested that a nonlinear relationship exists, where by profitability is improved for banks that hold some liquid assets, however, there is a point beyond which holding further liquid assets diminishes banks’ profitability, all else equal.

Botoe (2011) investigated the effect of liquidity on financial performance of commercial banks in Liberia by using multiple linear regression analysis; the study analyzed the financial performance of the commercial banks using balanced panel data six years between 2006 and 2011. The study used the loans to asset ratio and Return on asset as the measures for estimating liquidity and performance respectively. The study established that loans to asset ratio had a significant positive relationship with profitability of the banks.

Tseganesh (2012) has done a study which has two objectives: firstly, to identify determinants of commercial banks liquidity in Ethiopia and then to see the impact of banks liquidity up on financial performance through the significant variables explaining liquidity. Balanced fixed effect panel regression was used for the data of eight commercial banks in the sample covered the period from 2000 to 2011. Eight factors affecting banks liquidity were selected and analyzed. The study found that the impact of bank liquidity on financial performance was non-linear/positive and negative. Capital adequacy ratio had positive and significant impact on financial performance, on the other side non-performing loan had negative and significant impact on financial performance measured by return on asset and return on equity.

Shahchera (2012) explored the effect liquidity on financial performance of banks in Iran. The study used the Generalized Method of Moments (GMM) to analyze the collected data. The data available was unbalanced panel data for the period between 2002 and 2009. The authors used loans to asset ratio for measuring liquidity to enable testing the relationship with profitability. The study established that the relationship between profitability of the banks and loans to asset ratio was non-linear. This implied that profitability of the banks increased up to certain levels of loans to asset ratio where it started decreasing with increased loans to asset ratio beyond that level. The relationship showed an inverted u-shape.

Ahmed *et al.,* (2012) examine liquidity risk and its effect on banks’ profitability in 22 Pakistani banks during 2004 to 2009 by using multiple regressions. Their study results suggest that liquidity risk affects bank profitability very significantly. Here, non-performing loans is the factor that enhance the liquidity risk as it has a negative relationship with profitability.

Olangunji *et al*., (2012) in their study of bank liquidity risk with profitability and found that there is a significant positive relationship between bank liquidity and its performance. They argued that there is a two-way relationship, especially for commercial banks, where banks’ accelerating performance and profitability is significantly influenced by high levels of liquidity and vice-versa.

Lartey V, Antwi1 S, Boadi E. (2013) studied the relationship between the liquidity and the profitability of banks listed on Ghana Stock Exchange and revealed that there was a very weak positive relationship between the liquidity and the profitability of the listed banks in Ghana.

Nathnael (2013) argument out their learning that here is an adverse relationship among liquidity and recurrence of banks. This is consistent with the result of a study done by Naser, Mohammad and Ma'someh, (2013) which is created on 15 banks of Iran throughout the years 2003-2010, wherever liquidity menace had a meaningfully negative outcome on performance.

Nathnael (2013) point out in their study that there is a negative relationship between liquidity and performance of banks. This is consistent with the result of a study done by Naser, Mohammad and Ma'someh, (2013) which is based on 15 banks of Iran during the years 2003-2010, where liquidity risk had a significantly negative effect on performance.

Wambu (2013) uses the liquidity coverage ratio (LCR) to explore whether commercial banks ' profitability is influenced by all 44 commercial banks ' liquidity levels for the years 2008 to 2012. The research finds a positive relationship between ' profitability and liquidity of commercial banks in Kenya.

The study made by Siaw (2013), presented the empirical evidence on liquidity risk and banks profitability of Ghanaian banks with an unbalanced data set of 22 banks over a 10-year period spanning from 2002-2011. It applied a panel data using the two stages least squares (2SLS) regression analysis method. The study concludes that the bank profitability which is measured by Return on asset and Return on equity are positively affected by liquidity risk that is, banks with high exposure to liquidity risk made higher profits resulting from higher net interest margins as compared with banks with low liquidity risk exposure. The researcher recommend that the bank should reduce the percentage of liquid asset held rather increase in the percentage of illiquid asset (loan disbursed) in order to maximize the profit through high interest income. This will achieve by collecting huge amount of deposit and also consider it as the major source of funding by making the saving more attractive.

Lartey *et al.*,(2013) examined the effect of liquidity on the profitability of listed banks in Ghana. The study sampled the entire seven listed bank on the Ghana Stock Exchange at the time over a 6 year period from 2005 to 2010. The study revealed that the liquidity and profitability position of listed banks in Ghana declined over the study period. The regression and correlation analysis revealed that there was a weak positive and statistically insignificant relationship between liquidity and profitability of listed banks in Ghana.

Maaka, (2013), Wanjik and Assumptah, (2017) used non-performing loan as a variable to measure the impact of liquidity risk on financial performance. As per the above researcher and analysis the expected result is negative relationship between non-performing loan and financial performance of commercial banks. Thus, there is a negative relationship exist between liquidity risk and financial performance of commercial banks measured by return on asset.

Mamatazakis and Bermapi (2014) attempted to find out the relationship between liquidity risk and bank performance in G 7 and Switzerland. The research sampled 97 banks and discovered that liquidity risk had a negative impact on bank performance.

Abdullah and Jahan (2014) examined the impact of liquidity on commercial bank in Bangladesh. The study sample was five commercial bank using panel data over a five-year period from 2009-2013 where return on assets and return on equity were used to measure bank profitability and loan deposit ratio, deposit asset ratio and cash deposit ratio were used to measure liquidity. The results of the study showed that there is no significant relationship between liquidity and profitability of listed commercial banks in Bangladesh.

Alzorqan (2014) studied the relationship of liquidity risk and bank performance for 2 banks of Jordan from the period 2008 -2010. Return on asset and Return on equity were used as indicator of Bank performance. Loan to deposit was used as liquidity measures. Correlation and Regression were done to test the relationship. In correlation analysis the relationship between loan to deposit with Return on asset and Return on equity are found positive. Overall results indicated that there is a relationship between liquidity risk and bank performance in Jordon banks.

Ferrouhi (2014) researched about Moroccan banks ' financial performance with liquidity taking 4 banks for the period 2001-2012. Return on asset, return on equity, Return on average assets and Net interest margin, 6 liquidity ratios are used as performance indicators. The research disclosed a positive relationship between liquidity ratios with bank performance.

Said (2014) analyze the impact of Liquidity risk on Malaysian commercial banks profitability for the period 2005-2011 by using Net Stable Funding Ratio (NSFR) as a proxy for measuring liquidity risk and return on asset and return on equity as a proxy for measuring bank performance. The study employed Pooled Ordinary Least Squares (POLS) and Fixed Effect estimations. They showed a positive relationship between NSFR with return on equity (ROE) and return on assets (ROA). Thus, there is a positive relationship exists between liquidity risk and bank’s performance.

Alshatti (2015) examined the impact of liquidity on profitability for the period 2005-2012 of 13 commercial banks in Jordan. The outcome of the regression disclosed an indirect association between capital to total asset ratio and profitability measured by return on asset and return on equity was acquired.

Ajibike and Aremu (2015) evaluated the impact of liquidity on Nigerian bank performance. They sought to raise understanding of the role of liquidity on the performance of commercial banks in Nigeria. The study used Generalized Method of Moments (GMM) estimation technique for a panel of 13 banks from the period of 2004 to 2012. The study found a positive relationship between liquidity and bank performance. It concludes that bank liquidity, size of the board and debt structure is significant determinants of banks performance in Nigeria. On the basis of the findings, they recommended that banks should increase their liquidity base to achieve higher performance.

Rahman and Saeed (2015) measured the effects of liquidity risk on performance of 21 commercial banks in Malaysia for the period 2005 to 2013. Return on asset and Return on equity are used as indicator to judge bank performance. Loan to deposit ratio and capital to asset ratio are used as liquidity indicators. The study revealed capital to asset ratio has mixed results on bank performance. The study concluded the effects of liquidity indicators on bank performance are mixed and could not draw a clear result.

Cuong Ly (2015) examined the relationship between Liquidity risk and the performance of European banks. The study composed of sample from a panel of EU27 observed during the year from 2001-2011. The empirical finding of this research asserts a negative relationship between liquidity risk and bank performance.

Nyabate (2015) investigated the effect of liquidity on profitability of commercial banks that were listed in the NSE. The study was conducted in the wake of failure of several banks which had failed to observe prudent liquidity risk management practices. The study hence sought to seek the optimum liquidity level that would positively influence performance of financial institutions by balancing the risk and returns of holding liquid assets. Secondary data was collected from the audited and published financial reports of 19 financial institutions for five years (2010 – 2014). In analyzing the data, an OLS regression model was adopted to evaluate the effect of liquidity on financial performance. Loan to deposit ratio was used to measure liquidity while Return on asset was used as a measure of financial performance. The study findings revealed that there was a positive association between liquidity of the financial institutions and their financial performance.

Kim (2015) investigated the impact of liquidity on banks performance in European Union countries panel data for the three year period and sample data from 23 European Union countries was used. The findings were a negative relationship between liquidity ratios and performance.

Dahiyat (2016) researched into the effect of liquidity on profitability of fifteen Jordanian Banks for financial years 2012-2014. The result obtained from the regression revealed that liquidity exerts significant negative effect on profitability of Jordanian banks.

Sirak (2016) studied the impact of liquidity on profitability of private commercial banks specifically Nib international bank. The study used both qualitative and quantitative data and the time series data taken from during 1999-2015 and analyzed using multiple regressions. The study used loan to deposit ratio. The dependent variable was Return on asset. The study found that loan to deposit ratio had significant positive impact on profitability and finally conclude that liquidity had significant impact on profitability of NIB.

Khan and Ali (2016) examined the impact of liquidity on profitability of commercial banks in Pakistan. The study used secondary data extracted from the financial statement of some selected banks over a five-year period from 2008 to 2014 by using correlation and regression analysis, the results of the study revealed that a significant positive relationship between liquidity and profitability of commercial banks.

Muriithi and Waweru (2017) examined the effect of liquidity risk on financial performance of commercial banks in Kenya. The period of interest was between year 2005 and 2014 for all the 43 registered commercial banks in Kenya. Liquidity risk was measured by liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) while financial performance was measured by return on equity (ROE). Data was collected from commercial banks' financial statements filed with the Central Bank of Kenya. Panel data techniques of random effects estimation was used, and the result revealed that net stable funding ratio inversely affect the return on equity while liquidity coverage ratio does not significantly influence the financial performance of commercial banks.

Hakimi and Zaghdoudi (2017) studied the effect of liquidity risk on the performance of 10 Tunisian banks from 1990 to 2015. The result of Random effect regression is that liquidity risk decreases the performance of banks.

Idowu, *et al.,* (2017) studied the effect of liquidity management on financial performance of listed deposit money banks in Nigeria. The research used data extracted from the annual reports of 4 sampled banks from 2007 and 2016. The result revealed that liquidity management has significant positive relationship with profitability when measured by return on equity and no significant relationship with profitability when measured by return on asset.

**2.4 Summary of Literature Review and Research Gap**

As per the above theoretical and empirical review, the review shows that there is little study that examines the impact of liquidity risk on profitability of commercial banks. The few studies used liquidity risk as one of the factors that influence profitability of commercial banks. The review of theories explaining bank liquidity risk and how it impacts on the profitability of banks as well as the empirical review shows some conflicting or mixed results. On the empirical results, some studies reported a positive significant relationship between liquidity risk and profitability of commercial banks (Bourke, 1989; Eichengreen and Gibson, 2001; Kosmidou *et al.,* 2005; Kosmidou, 2008; Olagunju *et al.,*2012; Osuji, 2013; Abubakar *et al.*, 2015; Warrad *et al.,* 2015; Khan and Ali, 2016), other studies have reported a negative significant relationship between liquidity risk and profitability of commercial banks (Molyneux and Thorton,1992; Guru *et al.,*2002; Raheman and Nasr, 2007; Marozva, 2015, Islam *et al.,* 2016; Kindu, 2019) while other studies reported no significant impact of liquidity risk on profitability of commercial banks (Shen *et al.,* 2010; Lartey *et al.,* 2013; Abdullah and Jahan, 2014). It can therefore be deduced that previous studies on bank’s liquidity risk and performance still leave huge gaps since their studies have not reached a compromised conclusion on the subject matter, thereby needing extra work or further research is required to exploit the gap. Hence, this study aims to fill those gaps in the literature especially in the context of the banking sector of Bangladesh.

**2.5 Conceptual Framework**

The conceptual framework identifies the variables that when put together explain the issue under study. After careful study of literature review, the following conceptual framework is formulated to illustrate the effects of liquidity risk on financial performance of selected commercial banks in Bangladesh. In this study the conceptual framework comprised of nine independent variables and two dependent variables. The selections of variables are based on previous relevant studies. Therefore the following diagram discuses about the conceptual framework: **2.6 Development of Hypothesis**

This section attempts to see the relationship between the dependent and independent variables through testing the hypothesis regarding to the relationships between liquidity risk and financial performance of Selected Commercial banks in Bangladesh. Bank specific variables include non-Performing loan ratio (NPLR), Capital Adequacy ratio (CAR), Capital to total asset ratio (CTAR), Loan to deposit ratio (LTD), Loan to total asset ratio (LTA), Deposit to asset ratio (DTA), Cash to deposit ratio (CDR), Liquidity coverage ratio (LCR) and Net stable funding ratio (NSFR). Hence, to attain the objective of the study the following hypotheses that can be derived are as follows:

H1: NPLR, CAR, CTAR, LTD, LTA, DTA, CDR, LCR, NSFR has significant impact on Return on asset ROA.

H2: NPLR, CAR, CTAR, LTD, LTA, DTA, CDR, LCR, NSFR has significant impact on Return on equity ROE.

**3. RESEARCH METHODOLOGY**

**4.1 Introduction**

Research methodology is the procedure to gather data and information to making the choices for business decision. Under this section the researcher see source, method of data collection, target population, sampling frame, sampling techniques, sample size, method of data analysis, statistical tools, variables definition and model specification. Methodology is the deliberate, hypothetical examination of the strategies connected to a field of study. It includes the theoretical analysis of the collection of techniques and standards associated with a branch of information. Commonly, it envelops concepts, for example, theoretical frameworks, and stages, qualitative or quantitative methods. This chapter outlines the research methodology that this study applied. It includes research method, research design, research approach, research source, the population that is targeted in the study and the sampling methods that are applied. Further, the chapter presents the data collection procedure and discusses the empirical model that is applied. Lastly, the chapter presents the procedures that are used in data analysis and how the analyzed data is presented.

**3.2 Research Method**

Quantitative research is a set of methods and techniques that allow researchers to answer research questions. It is used to meet the overall objective of this study to frame the descriptive approach to determine the outcome and impact by running the hypothesis under it. Quantitative methods and techniques tend to specialize in quantities in the sense that numbers represent values and levels of theoretical constructs and concepts. This research method is also related with discovering proof to either support or reject theory that is defined in the earlier phases of the study.

**3.3 Research Design**

Research design is a plan outlining how information is to be gathered for an assessment or evaluation that includes identifying the data gathering method(s), the instruments to be used, how the instruments would be administered, and how the information would be organized and analyzed (Assumptah & Muhari, 2017). It also describes issues involve in the research design relate to the purpose of the study; exploratory, descriptive and/or causal. The research design used for this study is a descriptive research design that basically involve obtaining information concerning the current status of phenomena to describe,” What exist” with respect to variables or condition in a situation (Gardner, Dixie, & S.C.,2004).

**3.4 Research Approach**

Research approach can be divided within two categories:

1. Deductive research method
2. Inductive research method

This research is using deductive approach associate with quantitative research. It is carried out with a concentration of developing hypothesis based on existing theory, and then formulates a research strategy to test the hypothesis (Wilson, J. 2014). This approach is best fitted with the Deductive approach which refers to the deduction of the conclusions from the propositions. The relevance of hypothesis to the study is the main distinctive point between deductive and inductive approaches. Deductive approach tests the validity of current assumptions or hypothesis whereas inductive approach contributes to the emergence of new theories. A deductive research approach might test to see if this relationship or link did obtain on more general circumstances.

**3.5 Research Source and Nature of Data**

In order to efficiently carry out a scholarly work, it is important to decide on how to collect data. Thus, the study has been prepared by analyzing secondary data. Secondary data are existing data that can be retrieved from existing literature; internet, books, articles, journals, magazine, annual reports and newspaper etc. depending on the subject area one intends to investigate. It also refers to those data which are already published or collected by someone other than the researcher or for some other purposes than the current research project (Zikmund, 2013). As per Zikmund *et al.* (2009) secondary data are essential in instance when primary data can ‘t be obtained, and they are quickly available. Since, sufficient data is obtained from secondary sources which help to achieve this study objective. The panel secondary data is quantitative in nature and encompass financial statement reports. The secondary data include audited annual reports specifically audited report of 20 commercial bank’s balance sheet, income statement and cash flow statement. Secondary data used in this study has been extracted from the annual reports of each individual bank which has been obtained from the official web sites published by the commercial banking companies in Bangladesh for a period of 5 years from 2014 to 2018. Those banks are - Mutual Trust Bank, Dhaka Bank, Bank Asia, NRBC Bank, Prime Bank, Premier Bank, BRAC Bank, City Bank, Southeast Bank, Eastern Bank, Mercantile Bank, IFIC Bank, NCC Bank, United Commercial Bank, Dutch Bangla Bank, Standard Bank, National Bank, NRB Bank, Jamuna Bank and Midland Bank Limited.

**3.6 Methods of Data Collection**

The data obtained from banks financial statement used to determine bank specific variables that determine liquidity risk and profitability of the bank. In order to increase the credibility and reliability of the research the study used audited financial statements (balance sheet, income statement and cash flow statement) of each bank sourced from commercial banks. Selecting appropriate and acceptable data gathering instrument help the researchers to combine the strengths and amend some of the inadequacies of any source of data to minimize risk of irrelevant conclusion. Thus, our sample consists of 20 Commercial banks in Bangladesh. Data must be available during the study period from the year 2014 to 2018. Firstly, all the annual reports of the 20 banks were downloaded from the website of the respective banks; the information was then searched manually from the specific annual reports of each 20 banks and then the numerical data such as ratios that is obtained by computing the respective variables concerned with the liquidity risk and performance measurement in the annual reports of bank constitute the empirical inputs for testing hypotheses. Here the profitability of the banks is represented by Return on Assets (ROA) and Return on Equity (ROE). These two will serve as the dependent variables. The independent variables that will measure liquidity risk are Non-Performing loan ratio (NPLR), Capital Adequacy ratio (CAR), Capital to total asset ratio (CTAR), Loan to deposit ratio (LTD), Loan to total asset ratio (LTA), Deposit to asset ratio (DTA), Cash to deposit ratio (CDR), Liquidity Coverage ratio (LCR) and Net Stable Funding ratio (NSFR).

**3.7 Target Population and Sampling Frame**

**3.7.1 Target Population**

A population is defined as total collection of elements/ individuals/ organizations about which conclusions and inferences are made (Cooper & Schindler, 2011). Mugenda and Mugenda (2008) assert that target population is that population to which a researcher wants to generalize the results of his study. Hence, the target populations of this study are all commercial banks in Bangladesh between 2014 to 2018, from which presently, 20 commercial banks are selected, namely, Mutual Trust Bank Limited (MTBL), Dhaka Bank Limited (DBL), Bank Asia Limited, NRBC Bank Limited, Prime Bank Limited (PBL), Premium Bank Limited (PBL), BRAC Bank Limited, City Bank Limited, Southeast Bank Limited (SBL), Eastern Bank Limited (EBL), Mercantile Bank Limited (MBL), IFIC Bank Limited, NCC Bank Limited, United Commercial Bank Limited (UCBL), Dutch Bangla Bank Limited (DBBL), Standard Bank Limited (SBL), National Bank Limited (NBL), NRB Bank Limited, Jamuna Bank Limited (JBL) and Midland Bank Limited (MBL).

**3.7.2. Sampling Frame, Techniques and Size**

According to Cooper and Schindler (2011) a sampling frame is a list of elements from which a sample is actually drawn. The sample was drawn from a list of population elements that often differs somewhat from the defined target population. Thus, this study takes a convenient sample of 20 commercial banks that have been operating the banking service in Bangladesh for more than 10 years. All of them that included in this study are operated equal or above 10 years and operated in a wide range of geographical areas of Bangladesh which enables a fair representation of bank industry in Bangladesh. The reason behind taking five years data of 20 commercial banks is to increase the sample size. Therefore, the matrix sample frame will be 5\*20 that includes 100 observations.

**3.8 Method of Data Analysis and Statistical Tools**

After collecting the relevant data, the statistical tools used to analyze the data for deriving various relationships among the variables are mentioned below:

**3.8.1 Descriptive Statistics**

The descriptive analysis part deals with a simple description of variables. It includes mean, maximum, minimum, and standard deviation of each variable. Thus, descriptive statistics of the variables (both dependent and independent) were calculated over the sample period. This is in line with Malhotra (2007), which states using descriptive statistics methods helps the researcher in picturing the existing situation and allows relevant information.

**3.8.2 Linear Regression Analysis**

It attempts to model the relationship between two or more variables by fitting a linear equation to observed data. A linear regression line has equation of the form Y= a + bX where X is the independent variable and Y represent the dependent variable. Linear regression used to estimate the statistical relationship at 5% level of significance. The correlation coefficient (R) determines the magnitude of the relationship between the independent and dependent variables. Coefficient of determination R-square the percentage variation in the dependent variable being explained by the changes in independent variables provides information about levels of variability within a regression model and P-value were used to determine the fit of the model and overall significance of the relationship. Finally, hypothesis testing is performed by running the structural models. In analyzing the data, IBM SPSS version 20 is used.

**3.8.3 IBM SPSS Statistics 25**

Statistical Package for Social Sciences (SPSS) is a software package used for logical batched and non-logical statistical analysis tool that provides various statistical calculations such as linear regression analysis, descriptive statistics, correlation, bivariate statistics and numeral outcome prediction etc. In this study, IBM SPSS version 20 is used to compute the data to obtain a result for analyzing the relationship between liquidity risk and financial performance of respective banks taken as sample.

**3.9 Definition of Variables and their measurement**

**Table 1: Definition of Dependent Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Dependent** **Variables**  | **Definition** | **Acronym**  | **Measurement**  |
| **Return on Asset**  | The ratio of net income to total asset of the company.  | ROA  | Annual Net Income / Average Total Assets  |
| **Return on Equity**  | The ratio of net income to total equity of the company  | ROE  | Annual Net Income / Shareholder’s Equity  |

**Source:** Author

**Table 2: Definition of Independent Variables**

|  |  |  |  |
| --- | --- | --- | --- |
| **Independent** **Variables**  | **Definition**  | **Acronym**  | **Measurement**  |
| **Non-Performing Loan Ratio**  | The percentage of nonperforming loans on total volume of loans.  |  NPLR  | Non-Performing Loans / Total Loans  |
| **Capital Adequacy Ratio**  | A measurement of a bank’s available capital expressed as a percentage of a bank’s risk weighted credit exposures.  |   CAR | (Tier I Capital + Tier II Capital) /Risk Weighted Asset  |
| **Capital to Total Asset Ratio**  | The ratio of total equity on total asset  | CTAR  | Total Equity / Total Assets |
| **Loan to Deposit Ratio**  |  The ratio of total loans on total deposits.  |  LTD  |  Total Loans / Total Deposit  |
| **Loan to Total Asset Ratio**  | The proportion of total assets of the bank has invested for loans.  |  LTA  | Total Loans / Total Assets  |
| **Deposit to Asset Ratio**  | The proportion of a bank’s asset To total asset ratio.  |  DTA | Total Deposit / Total Asset  |
| **Cash to Deposit Ratio**  | It measures the bank’s liquidity in the case that the bank cannot borrow from other banks.  |  CDR  | Cash & Cash Equivalents / Total Assets  |
| **Liquidity Coverage Ratio**  |  It refers to the proportion of highly liquid assets held by financial institutions over a 30-day stress period. |    LCR |  High quality liquid asset amount / Total net cash flow amount   |
| **Net Stable Funding Ratio**  | A liquidity standard requiring banks to hold enough stable funding to cover the duration of their long-term assets.  |   NSFR | Available amount of stable funding / Required amount of stable funding  |

**Source:** Author

**3.10 Regression Model Specification**

The study uses a general linear model of regression to establish the relationship between the independent and the dependent variables. The model has been fixed by considering the variables used in previous studies. The model is as follows:

Model 1: ROA = β0 +β1NPLR + β2CAR + β3CTAR + β4LTD + β5LTA+ β6DTA+ β7CDR+ β8LCR+ β9NSFR+ €

Model 2: ROE = β0 + β1NPLR + β2CAR + β3CTAR + β4LTD + β5LTA+ β6DTA+ β7CDR+ β8LCR+ β9NSFR+ €

Where, β = constant term,

Β1 – β9 = coefficient of independent variants

€ = regression error term

ROA = Return on Asset

ROE = Return on Equity

NPLR = Non-performing loan ratio

CAR = Capital Adequacy Ratio

CTAR = Capital to total asset ratio

LTD = Loan to Deposit Ratio

LTA = Loan to Total Asset Ratio

DTA = Deposit to asset ratio

CDR = Cash to Deposit Ratio

LCR = Liquidity Coverage Ratio

NSFR = Net Stable Funding Ratio

**4. FINDINGS, ANALYSIS & DISCUSSION**

**4.1 Introduction**

This chapter will describe the analysis of data followed by a discussion of the research findings. The findings are related to the research objective that guided the study. To analyze the data IBM SPSS Statistics version 20 is used to provide various statistical calculations such as Descriptive Statistics, Linear Regression Analysis i.e., model summarization, ANOVA, coefficient, etc.

**4.2 Liquidity Risk and Return on Asset**

**4.2.1 Descriptive Statistics**

The descriptive statistics of both independent and dependent variables are presented below in Table 1 and Table 5. The dependent variable is Return on asset (ROA) and Return on equity (ROE). While the independent variables are Non-Performing loan ratio (NPLR), Capital Adequacy ratio (CAR), Capital to total asset ratio (CTAR), Loan to deposit ratio (LTD), Loan to total asset ratio (LTA), Deposit to asset ratio (DTA), Cash to deposit ratio (CDR), Liquidity Coverage ratio (LCR) and Net Stable Funding ratio (NSFR).

**Table 3: Descriptive Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **N**  | **Minimum**  | **Maximum**  | **Mean**  | **Std. Deviation**  |
| **ROA NPLR**  | 100  | -.25  | 3.18  | 1.1256  | .47818  |
| 100  | .00  | 10.64  | 4.7268  | 2.21056  |
| **CAR**  | 100  | 9.01  | 43.95  | 14.2292  | 5.43072  |
| **CTAR**  | 100  | 5.82  | 29.42  | 9.6061  | 4.04870  |
| **LTD**  | 100  | 66.70  | 109.97  | 82.7075  | 7.13436  |
| **LTA**  | 100  | 43.03  | 77.23  | 67.4669  | 6.19641  |
| **DTA**  | 100  | 56.13  | 85.04  | 76.2135  | 5.76277  |
| **LCR**  | 100  | 90.18  | 418.80  | 133.3969  | 43.88550  |
| **NSFR**  | 100  | 89.10  | 1027.66  | 120.9176  | 92.06605  |
| **Valid N** **(listwise)**  | 100  |   |   |   |   |

Table 1 presents descriptive statistics for the variable used in this study. As seen in the above table the total number of sample is 100, Return on Asset (ROA) having a mean of 1.1256, where the minimum value is -0.25 and maximum is 3.18 while having a standard deviation of 0.47818. On the average, the non-performing loan ratio (NPLR) is 4.7268 and minimum and maximum is 0.00 and 10.64 respectively. The mean of capital adequacy ratio (CAR) is 14.2292 bears minimum and maximum 9.01 and 43.95 respectively. Regarding the Capital to total asset ratio (CTAR), the average is 9.6061 where minimum and maximum is 5.82 and 29.42 respectively. The mean of Loan to deposit ratio (LTD) is 82.7075 with minimum and maximum value of 66.70 and 109.97 respectively. The mean of Loan to total asset ratio (LTA) is 67.4669 while having minimum and maximum value of 43.03 and 77.23 respectively. The mean of Deposit to asset ratio (DTA) is 76.2135, with minimum and maximum value of 56.13 and 85.04 respectively. The mean of Cash to deposit ratio (CDR) is 13.2013 with minimum and maximum value of 6.21 and 38.57 respectively. The mean of Liquidity Coverage ratio (LCR) is 133.3969 with minimum and maximum value of 90.18 and 418.80 respectively. Finally for Net Stable Funding ratio (NSFR). It has a mean of 120.9176 and a minimum and maximum point of 89.10 and 1027.66 respectively.

**4.2.2 Model Summary**

**Table 4: Model Summary**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model**  | **R**  | **R Square**  | **Adjusted R Square**  | **Std. Error of the Estimate**  |
| 1  | .673a  | .453  | .398  | .37100  |

a. Predictors: (Constant), NSFR, LCR, DTA, NPLR, LTD, CDR, CTAR, LTA, CAR

 b. Dependent Variable: ROA

In the above table, the value of R is 0.673 this expresses that there is a high degree of positive relationship between the dependent variable ROA and the independent variables NPLR, CAR, CTAR, LTD, LTA, DTA, CDR, LCR, and NSFR. If the independent variables increase at that point this will result in the dependent variable increase accordingly. So it can be said that, liquidity risk effects on banks profitability.

The value of Adjusted R square is 0.398 which shows that only 39.8% of the variation in the dependent variable Return on Asset (ROA) can be explained by the variations in the independent variables NPLR, CAR, CTAR, LTD, LTA, DTA, CDR, LCR and NSFR. Whereas from past study conducted by Abdullah and Jahan (2014) their adjusted R square was 50% for the model used for calculating ROA.

**4.2.3 ANOVA**

**Table 5: ANOVAa**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model** **1**  | **Sum of Squares**  | **df**  | **Mean Square**  | **F**  | **Sig.**  |
| Regression  Residual Total  | 10.249  | 9  | 1.139  | 8.274  | .000b  |
| 12.388  | 90  | .138  |   |   |
| 22.637  | 99  |   |   |   |

1. Dependent Variable: ROA
2. Predictors: (Constant), NSFR, LCR, DTA, NPLR, LTD, CDR, CTAR, LTA, CAR

The table above shows the ANOVA test of the fitness of the model. With an F statistic of 8.274 and significance = 0.000, shows that the data fits the model well and this indicates that the variables specified in the model are actual predictors of performance.

**4.2.4 Coefficients**

**Table 6: Coefficientsa**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model** **1**  | **Unstandardized Coefficients**  | **Standardized Coefficients**  | **t**  | **Sig.**  |
| **B**  | **Std. Error**  | **Beta**  |
| **(Constant)** **NPLR** **CAR** **CTAR LTD**  **LTA** **DTA** **CDR** **LCR** **NSFR**  | 1.419  | 1.141  |   | 1.244  | .217  |
| -.093  | .022  | -.428  | -4.151  | .000  |
| -.120  | .021  | -1.365  | -5.651  | .000  |
| .149  | .026  | 1.265  | 5.845  | .000  |
| -.017  | .008  | -.251  | -2.099  | .039  |
| .039  | .012  | .501  | 3.260  | .002  |
| -.019  | .009  | -.228  | -2.127  | .036  |
| .008  | .009  | .087  | .891  | .375  |
| .004  | .001  | .394  | 4.329  | .000  |
| .000  | .000  | -.061  | -.770  | .443  |

1. Dependent Variable: ROA

Tests were conducted for significance at 95% confidence level, meaning that all the above tests must have p-value less or equal to 0.05 for the tests to be significant. Unstandardized coefficients indicate how much the dependent variable varies with an independent variable, when all other independent variables are held constant. Table 4 contains the beta coefficients of the 9 independent variables. The beta coefficients are indicators of the predictive powers of the individual variables. From the above table it can be seen that the beta constant is negative. The independent variables Non-performing loan ratio (NPLR), Capital adequacy ratio (CAR), Loan to deposit ratio (LTD) and Deposit to asset ratio (DTA) shows a negative beta coefficient implying there is an inverse relationship with the dependent variable return on asset (ROA). This indicates that a unit change in Non-performing loans ratio, Capital adequacy ratio, Loan to deposit ratio and Deposit to asset ratio result to an inverse change in performance by (0.093), (0.120), (0.017) and (0.019) respectively. This is in accordance with the previous findings conducted by Tseganesh (2012), Ahmed *et al.,* (2012), Maaka, (2013), Wanjik and Assumptah, (2017) which produced a negative relationship between Non performing loan ratio with Return on asset but Tseganesh (2012) showed positive relationship between Capital Adequacy ratio with Return on asset which is inconsistent with the findings of this study. Whereas, the result of Loan to deposit ratio and Deposit to asset ratio with Return on asset is inconsistent with the previous findings of Abdullah and Jahan (2014) where the study showed no significant relationship between Loan to deposit ratio and Deposit to asset ratio with Return on asset. However, some previous findings of Alzorqan (2014), Nyabate (2015), and Sirak (2016) showed positive relationship between Loan to deposit ratio with Return on asset which is inconsistent with the findings of this study.

On the other hand Capital to total asset ratio (CTAR), Loan to total asset ratio (LTA), and Liquidity Coverage ratio (LCR) shows a positive beta coefficient and are statically significant implying that there is a positive relationship with the dependent variable return on asset (ROA). This indicates that a unit change in Capital to total asset ratio (CTAR), Loan to total asset ratio (LTA), and Liquidity Coverage ratio (LCR) result to a proportional change in performance by 0.149, 0.039 and 0.004 respectively. This finding however contradict the previous findings of Alshatti (2015) and Rahman and Saeed (2015) where the study showed a negative significant relationship and a mixed relationship between Capital to total asset ratio with Return on asset respectively. However, the result of Loan to total asset ratio is in line with prior works of Botoe (2011) but not in line with the prior works of Athanasoglou *et al*., (2006) and Shahchera (2012) where the study showed no significant relationship and a non-linear relationship between Loan to total asset ratio with Return on asset respectively. Whereas, the result of Liquidity coverage ratio with Return on asset is supported by the previous works done by Wambu (2013).

However, the independent variables Cash to deposit ratio (CDR) and Net stable funding ratio (NSFR) have beta coefficients of 0.008 and 0.000 with p values of 0.375 and 0.443 respectively which are greater than 0.05, hence they are not statistically significant. Therefore, these independent variables have no significant relationship with the dependent variable Return on asset (ROA) which is in accordance with the findings conducted by Abdullah and Jahan (2014) where the study also showed no significant relationship between Cash to deposit ratio with Return on asset but contradicts with the previous findings of Said (2014) where the study showed a positive relationship between Net stable funding ratio with Return on asset.

According to the findings of the study the independent variables Non-performing loan ratio (NPLR), Capital adequacy ratio (CAR), Capital to total asset ratio (CTAR), Loan to deposit ratio (LTD), Loan to total asset ratio (LTA), Deposit to asset ratio (DTA) and Liquidity Coverage ratio (LCR) has a significant impact on the dependent variable Return on asset (ROA).

So, the first regression model becomes:

**ROA = 1.419 - 0.093 (NPLR) - 0.120 (CAR) - 0.017 (LTD) - 0.019 (DTA) + 0.039**

**(LTA) + 0.149 (CTAR) + 0.004 (LCR) + €**

**4.3 Liquidity Risk and Return on Equity**

**4.3.1 Descriptive Statistics**

**Table 7: Descriptive Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **N**  | **Minimum**  | **Maximum**  | **Mean**  | **Std. Deviation**  |
| **ROE NPLR**  | 100  | .86  | 22.16  | 11.9773  | 4.12516  |
| 100  | .00  | 10.64  | 4.7268  | 2.21056  |
| **CAR**  | 100  | 9.01  | 43.95  | 14.2292  | 5.43072  |
| **CTAR** **LTD** **LTA**  | 100  | 5.82  | 29.42  | 9.6061  | 4.04870  |
| 100  | 66.70  | 109.97  | 82.7075  | 7.13436  |
| 100  | 43.03  | 77.23  | 67.4669  | 6.19641  |
| **DTA**  | 100  | 56.13  | 85.04  | 76.2135  | 5.76277  |
| **CDR**  | 100  | 6.21  | 38.57  | 13.2013  | 5.06890  |
| **LCR**  | 100  | 90.18  | 418.80  | 133.3969  | 43.88550  |
| **NSFR**  | 100  | 89.10  | 1027.66  | 120.9176  | 92.06605  |
| **Valid N** **(listwise)**  | 100  |   |   |   |   |

Table 1 presents some descriptive statistics for the variable used in this study. As seen in the above table the total number of sample is 100 Return on Equity (ROE) having a mean of 11.9773, where the minimum value is 0.86 and maximum is 22.16 while having a standard deviation of 4.12516 on the average, the non-performing loan ratio (NPLR) is 4.7268 and minimum and maximum is 0.00 and 10.64 respectively. The mean of capital adequacy ratio (CAR) is 14.2292 bears minimum and maximum 9.01 and 43.95 respectively. Regarding the Capital to total asset ratio (CTAR), the average is 9.6061 where minimum and maximum is 5.82 and 29.42 respectively. The mean of Loan to deposit ratio (LTD) is 82.7075 with minimum and maximum value of 66.70 and 109.97 respectively. The mean of Loan to total asset ratio (LTA) is 67.4669 while having minimum and maximum value of 43.03 and 77.23 respectively. The mean of Deposit to asset ratio (DTA) is 76.2135, with minimum and maximum value of 56.13 and 85.04 respectively. The mean of Cash to deposit ratio (CDR) is 13.2013 with minimum and maximum value of 6.21 and 38.57 respectively. The mean of Liquidity Coverage ratio (LCR) is 133.3969 with minimum and maximum value of 90.18 and 418.80 respectively. Finally, for Net Stable Funding ratio (NSFR). It has a mean of 120.9176 and a minimum and maximum point of 89.10 and 1027.66 respectively.

**4.3.2 Model Summary**

**Table 8: Model Summary**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model**  | **R**  | **R Square**  | **Adjusted R Square**  | **Std. Error of the Estimate**  |
| 2  | .502a  | .252  | .177  | 3.74304  |

a. Predictors: (Constant), NSFR, LCR, DTA, NPLR, LTD, CDR, CTAR, LTA, CAR

b. Dependent Variable: ROE

In the above table, the value of R is 0.502 this expresses that there is a high degree of positive relationship between the dependent variable ROE and the independent variables NPLR, CAR, CTAR, LTD, LTA, DTA, CDR, LCR, and NSFR. If the independent variables increase at that point this will result in the dependent variable increase accordingly. So, it can be said that liquidity risk effects on banks profitability.

The value of Adjusted R square is 0.177 which shows that only 17.7% of the variation in the dependent variable Return on Equity (ROE) can be explained by the variations in the independent variables NPLR, CAR, CTAR, LTD, LTA, DTA, CDR, LCR and NSFR. Whereas, from past study conducted by Abdullah and Jahan (2014) their adjusted R square was 46% for the model used for calculating ROE.

**4.3.3 ANOVA**

**Table 9**: **ANOVAa**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model** **2**  | **Sum of Squares**  | **df**  | **Mean Square**  | **F**  | **Sig.**  |
| Regression  Residual Total  | 423.745  | 9  | 47.083  | 3.361  | .001b  |
| 1260.931  | 90  | 14.010  |   |   |
| 1684.676  | 99  |   |   |   |

1. Dependent Variable: ROE
2. Predictors: (Constant), NSFR, LCR, DTA, NPLR, LTD, CDR, CTAR, LTA, CAR

The table above shows the ANOVA test of the fitness of the model. With an F statistic of 3.361 and significance = 0.001, shows that the data fits the model well and this indicates that the variables specified in the model are actual predictors of performance.

**4.3.4 Coefficients**

**Table 10: Coefficientsa**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Model** **2**  | **Unstandardized Coefficients**  | **Standardized Coefficients**  | **t**  | **Sig.**  |
| **B**  | **Std. Error**  | **Beta**  |
| **(Constant)** **NPLR** **CAR** **CTAR** **LTD** **LTA** **DTA** **CDR** **LCR** **NSFR**  | 20.510  | 11.513  |   | 1.781  | .078  |
| -.704  | .225  | -.377  | -3.129  | .002  |
| -.393  | .215  | -.518  | -1.834  | .070  |
| .100  | .258  | .099  | .389  | .698  |
| -.170  | .081  | -.294  | -2.105  | .038  |
| .337  | .120  | .507  | 2.821  | .006  |
| -.150  | .090  | -.210  | -1.673  | .098  |
| .135  | .093  | .166  | 1.452  | .150  |
| .008  | .010  | .080  | .753  | .453  |
| -.005  | .004  | -.113  | -1.228  | .222  |

1. Dependent Variable: ROE

Tests were conducted for significance at 95% confidence level, meaning that all the above tests must have p- value less or equal to 0.05 for the tests to be significant. Table 8 contains the beta coefficients of the 9 independent variables. The beta coefficients are indicators of the predictive powers of the individual variables. From the above table it can be seen that the beta constant is negative.

The independent variables Non-performing loan ratio (NPLR), Capital adequacy ratio (CAR), Loan to deposit ratio (LTD), Deposit to asset ratio (DTA) and Net stable funding ratio (NSFR) shows a negative beta coefficient implying there is an inverse relationship with the dependent variable return on equity (ROE). This indicates that a unit change in Non-performing loans, Capital adequacy ratio, Loan to deposit ratio, Deposit to asset ratio and Net stable funding ratio result to an inverse change in performance by (0.704), (0.393), (0.170), (0.150) and (0.005) respectively. However, only Non-performing loan ratio (NPLR) and Loan to deposit ratio (LTD) have a significant negative relationship with Return on equity (ROE) but Capital adequacy ratio (CAR), Deposit to asset ratio (DTA) and Net stable funding ratio (NSFR) having p values of 0.070, 0.098 and 0.222 respectively which are greater than 0.05 hence, they are not statistically significant. Therefore, these independent variables have no significant relationship with the dependent variable Return on equity (ROE). This is in accordance with the previous findings conducted by Tseganesh (2012) which produced a negative relationship between Non-performing loan ratio with Return on equity but positive relationship between Capital Adequacy ratio with Return on equity which is inconsistent with the findings of this study. Whereas the results of Loan to deposit ratio and Deposit to asset ratio are in line with the prior works of Worku (2006) and Abdullah and Jahan (2014) respectively. However, some previous findings of Abdullah and Jahan (2014) and Alzorqan (2014) showed no significant relationship and positive relationship between Loan to deposit ratio with Return on equity respectively which is inconsistent with the findings of this study. Whereas the result of Net stable funding ratio contradicts with the previous findings of Said (2014) and Muriithi and Waweru (2017) which produced a positive relationship and an inverse/negative relationship between Net stable funding ratio with Return on equity respectively.

On the other hand, Loan to total asset ratio (LTA) shows a positive beta coefficient and is statistically significant implying that there is a positive relationship with the dependent variable Return on equity (ROE). This indicates that a unit change in Loan to total asset ratio result to an equal change in performance by 0.337. It is however not in line with the prior works of Athanasoglou *et al.* (2006) which produced no significant relationship with Return on equity.

Moreover, the other independent variables Capital to total asset ratio (CTAR), Cash to deposit ratio (CDR) and Liquidity Coverage ratio (LCR) have positive beta coefficients with p values of 0.698, 0.150 and 0.453 respectively which are greater than 0.05 hence, they are not statistically significant. Therefore, these independent variables have no significant relationship with the dependent variable Return on equity (ROE). Thus, the result of Cash to deposit ratio and Liquidity coverage ratio are supported by the works of Abdullah and Jahan (2014) and Muriithi and Waweru (2017) respectively. Whereas the result of Capital to total asset ratio contradicts with the previous findings of Alshatti (2015) and Rahman and Saeed (2015) which produced a negative significant relationship and a mixed relationship between Capital to total asset ratio with Return on equity respectively.

According to the findings of the study the independent variables Non-performing loan ratio (NPLR), Loan to deposit ratio (LTD) and Loan to total asset ratio (LTA) have a significant impact on the dependent variable Return on equity (ROE).

Thus, the second regression model becomes:

**ROE = 20.510 - 0.704 (NPLR) - 0.170 (LTD) + 0.337 (LTA) + €**

**Table 11: Influence of Liquidness risk on Return on Asset**

|  |  |  |
| --- | --- | --- |
| **Explanatory Variables**  | **T-test at 5% level of significance p<0.05**  | **Decision**  |
| **Non-Performing loan ratio (NPLR)**  |  p=0.000  |  Supported  |
| **Capital adequacy ratio (CAR)**  |  p=0.000  |  Supported  |
| **Capital to total asset ratio** **(CTAR)**  |  p=0.000  |  Supported  |
| **Loan to deposit ratio (LTD)**  |  p=0.039  |  Supported  |
| **Loan to total asset ratio (LTA)**  |  p=0.002  |  Supported  |
| **Deposit to asset ratio (DTA)**  |  p=0.036  |  Supported  |
| **Cash to deposit ratio (CDR)**  |  p=0.375  |  Not Supported  |
| **Liquidity Coverage ratio (LCR)**  |  p=0.000  |  Supported  |
| **Net Stable Funding ratio (NSFR)**  |  p=0.443  |  Not Supported  |

**Source:** Author

**Table 12: Impact of Liquidity risk on Return on Equity**

|  |  |  |
| --- | --- | --- |
| **Explanatory Variables**  | **T-test at 5% level of significance p<0.05**  | **Decision**  |
| **Non-Performing loan ratio (NPLR)**  |  p=0.002  |  Supported  |
| **Capital adequacy ratio (CAR)**  |  p=0.070  |  Not Supported  |
| **Capital to total asset ratio** **(CTAR)**  |  p=0.698  |  Not Supported  |
| **Loan to deposit ratio (LTD)**  |  p=0.038  |  Supported  |
| **Loan to total asset ratio (LTA)**  |  p=0.006  |  Supported  |
| **Deposit to asset ratio (DTA)**  |  p=0.098  |  Not Supported  |
| **Cash to deposit ratio (CDR)**  |  p=0.150  |  Not Supported  |
| **Liquidity Coverage ratio (LCR)**  |  p=0.453  |  Not Supported  |
| **Net Stable Funding ratio (NSFR)**  |  p=0.222  |  Not Supported  |

**Source:** Author

**4.4 Revised Conceptual Framework**

The study indicated that Non-performing loan ratio (NPLR), Capital adequacy ratio (CAR), Capital to total asset ratio (CTAR), Loan to deposit ratio (LTD), Loan to total asset ratio (LTA), Deposit to asset ratio (DTA) and Liquidity Coverage ratio (LCR) has significant impact on financial performance of selected commercial banks, measured in terms of Return on Asset (ROA) whereas, Non-performing loan ratio (NPLR), Loan to deposit ratio (LTD) and Loan to total asset ratio (LTA) has significant impact on financial performance of selected commercial banks, measured in terms of Return on equity(ROE). Therefore the results indicate that liquidity risk influence the financial performance of selected commercial banks in Bangladesh. The revised conceptual framework below summarizes the findings reached.

**Liquidity Risk**

**Capital Adequacy ratio**

**Capital to total asset ratio**

**Deposit to asset ratio**

**Liquidity Coverage ratio**

**Non-performing loan ratio rratio ratio**

**Loan to deposit ratio**

**Loan to total asset ratio**

**Return on**

**Asset (ROA)**

**Return on**

**Equity (ROE)**

**Financial**

**Performance**

Source: Researchers own design

**Figure 2: Revised Conceptual Framework**

**5. RECOMMENDATIONS & CONCLUSION**

**5.1 Recommendations**

Based on the finding and analysis of this study the following recommendations are given:

* The bank profit has negatively affected by non-performing loan ratio meaning commercial banks of Bangladesh which are selected for this study held much more non-performing loans. So, it is advisable for a bank’s management to lower non-performing loans to minimize liquidity risk and maximize profitability.
* The profitability of banks has also negatively affected by capital adequacy ratio. So, it is advisable for a bank to maintain an optimum level of core capital and statutory capital to improve banks financial performance and to ensure that they have the ability to fund their liabilities when they are expected to do so.
* Since, Loan to deposit ratio has negatively affecting Bank’s financial performance meaning selected commercial banks has not used their asset to generate income and loans that commercial banks deliver to customers are not growing at the same pace as deposit. It is advisable for banks to invest their asset to market either in the form of loan or other investments. Moreover, Banks should ensure that they lower their risks by having well thought out and optimum levels of loans relative to the customer deposits that they hold. This will enable the financial institutions to properly match the loans to deposits so that the liquidity risk is lowered.
* Bank’s financial performance has certainly influenced by loan to total asset rate. Therefore, financial institutions should ensure that Loan to total asset rate doesn’t go beyond. This implied that profitability of the banks increased up to certain levels of loans to total asset ratio where it started decreasing with increased loans to total asset ratio beyond that level. Thus, high levels of loans to total asset ratio are expected to negatively affect return on asset and return on equity (Graham & Bordeleau, 2010). This implies that the financial institutions need to closely monitor their loans to total asset levels in relation to their profitability so as to establish the optimum levels that stimulate the maximum profitability of the institution.
* As, Deposit to asset ratio has negatively affecting Bank’s profitability meaning selected commercial banks held much more liquid asset therefore it is advisable for a bank‘s management to invest the commercial banks tied up deposit/money on the market either in the form of loan or other investment and develop different new credit products like personnel loan, vehicles loan, mortgage schemes with various real estate companies, to generate high amount of profit. However, the bank management pays the required attention to the liquidity management when they try to invest the tied-up deposit.
* The other recommendation is that the banks senior management formulates liquidity management strategy, policy and practices such as: the composition and maturity of assets and liabilities; the diversity and stability of funding sources; the approach to managing liquidity in different currencies, across borders, and across business lines and legal entities to manage liquidity risk and excessively hold liquid asset.
* Finally, the risk management authority of commercial banks in Bangladesh that are mandated to manage liquidity risk should identify and maintain optimal levels of liquidity to optimize financial performance by considering strengthened of the banks liquidity to ensure a sound process for identifying, measuring, monitoring and controlling liquidity risk. This process should include a robust framework for maintaining adequate liquidity through a comprehensive projection of cash flows arising from assets, liabilities and off-balance sheet items over an appropriate set of time horizons and by analyzing the institution’s past liquidity levels, the institution’s performance and risk indicators and this evidence should be use in arriving at the optimum liquidity levels that are best suited for the context of the institution.

**5.2 Conclusion**

The findings and analysis from this study leads to the following conclusions.

Banks confide liquidity to duly run their process. So, scarcity of liquidity is a matter for banks. The liquidness quandary is dominant in banks of Bangladesh at present-day. Stirring the consequence of liquidness, the learning tries to identify the current relationship between liquidness risk and financial execution of selected trade banks in Bangladesh. Preceding studies in Bangladesh were very insufficient and lessons in over-all were ambiguous. To fulfill this vent in study a descriptive figures and panel figures regression exploration for financial performance was pursed on secondary information culled from 20 mercantile banks over a 5 years’ time (2014-2018) through the variable explaining liquidity risk. Nine variables that intuition pecuniary performances of selected trade banks in Bangladesh were chosen and analyzed. From the list of possible explanatory variables, seven of them proved to be statistically significant. While two explanatory variables are statistically insignificant: namely Cash to deposit ratio (CDR) and Net Stable funding ratio (NSFR). The results regression using classic linear regression model enables us to make the following conclusions.

From the total nine independent variables seven of them are significant namely: Nonperforming loan ratio (NPLR), Capital Adequacy Ratio (CAR), Capital to total asset ratio (CTAR), Loan to deposit ratio (LTD), Loan to total asset ratio (LTA), Deposit to asset ratio (DTA) and Liquidity Coverage ratio (LCR). However, there are two independent variables which were statistically insignificant namely: Cash to deposit ratio (CDR) and Net Stable funding ratio (NSFR) had negative coefficient whereas Loan to total asset ratio (LTA) Capital to total asset ratio (CTAR) & Liquidity Coverage ratio (LCR) had positive coefficient and are statistically significant. Therefore, it might be terminated that the liquidity risk has a significant impression on pecuniary execution of Selected Mercantile Banks in Bangladesh.

**5.3 Limitations of the lesson**

* The study spanned a period of five years, during which commercial banks which are selected have been subject to various regulatory regimes. The Bangladesh Bank which regulates all commercial banks undertakes a regular update of the regulations guiding the operations of commercial banks in response to contemporary changes.
* Insufficient data is the main constraint in the development of the report and also there are no techniques to verify the accuracy of the collected data.
* Insufficient records and publications related to banks of Bangladesh have been another limitation in preparation of the report, for this reason not all the banks of Bangladesh are covered by this study.
* Finally, being a student, it would be wise to say that the researcher is still at the initial stage to be learnt to carry out such kind of research papers effortlessly.

However, despite of all those limitations, the researcher has tried to cover every crucial aspect of the study and tried to provide a fruitful result.

**5.4 Directions for Future Studies**

* It will be interesting if future studies make a relative study among private & public trade banks liquidity risk and consider government regulation and industry market variables and other risks like operational risks and market hazard on pecuniary accomplishment of tradeable banks. Farther more, it is recommended that to assess liquidity policies and practices of banks in their liquidity risk study.
* This learning attentive exclusively on the trade banks in Bangladesh. Similar studies can also be done in other financial sectors such as Islamic banks, microfinance institutions, savings and credit societies and insurance company etc. of the Bangladesh economy and those of other emerging economies.
* While this study provides some insights of the net stable funding ratio & liquidity coverage ratio, implications of the new liquidity frame works proposed by Basel committee. Therefore, there has to be further research on the area of liquidness risk and financial accomplishment of trade banks within Bangladesh.
* Finally, owing to the future studies, increasing the sample size and study time frame beyond 5 years may produce more robust results. Effects of other regulatory factors, other bank specific and macroeconomic factors of liquidity risk, such as Gross Domestic Product growth, Consumer price index and broad money supply, bank size, current rate, quick rate, investment ratio, liquid assets to total assets rate etc. on profitability should also be investigated.

**ACKNOWLEDGEMENT**

I would like to express my gratefulness to the almighty Allah, the most generous and merciful to every single living creature and their activities. Subsequently, I would like to express my gratitude to my beloved parents whose interminable love, backing and favors have constantly given me the inspiration to do the best. Moving towards in this research, the biggest support that was came from my research supervisor Mr. Ashequr Rahman (Lecturer, School of Business, East Delta University) who directed me in a great manner. Without her utmost supervision, suggestion and tremendous help, especially giving me adequate time despite her tight schedule. Next, I would like to give thanks to Mohammad Ahshan (Assistant Vice Chairman of Bank Asia Limited, Khatungonj Branch) and Mr. M. A. Faruk Ahmed, First Vice President & Head of Khatungonj Branch of Bank Asia Limited) for helping me to gain practical knowledge about corporate environment. Finally, I am grateful to all the researcher and the writers whose comprehensive research papers helped me to accumulate all the relevant information and valuable data while preparing the research.

**FUNDING**

The author didn’t receive any financial support for the research, authorship, and/or publication of this article.

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