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Relationship between Bank's Liquidity and Profitability in Bangladesh: An Empirical Analysis

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Abstract

This paper explores the relationship between banks' liquidity and profitability by considering four types of banks (State-owned Commercial Banks, Private Commercial Banks, Foreign Commercial Banks and Development Financial Institutions) operating in Bangladesh. We apply fixed effects model (FEM) by using data of these banks for the period 1997-2014. The paper finds that the expenditure-income ratio and excess liquidity ratio have negative impacts on banks' profitability (return on asset). The negative relationship of expenditure-income ratio and excess liquidity with bank's profitability is a major concern for the policymakers of the banking industry of Bangladesh.

Keywords: Liquidity, Profitability and Banking Industry.

JEL Classification: G21, C23.

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Introduction

In the recent time, banking industry faces two challenges, i.e, pressure of huge liquidity and declining of earning profit. The management of these two factors are very important for healthy growing of the banking business. For example, the liquid assets and excess liquidity as percent of total asset were 20.6 percent and 9.0 percent respectively in 2009 which increased to 32.7 percent and 15.7 percent in 2014 in the banking sector. Profitability as measured by return on asset (ROA), on the other hand, declined from 1.8 percent in 2010 to 0.7 percent in 2014 (BB, 2014-2015). Commercial banks in Bangladesh need to maintaining balance between liquidity and profitability for maximizing their profit. In this regard, the paper investigates the relationship between liquidity and profitability in the commercial banks in Bangladesh.[4]

The banking sector is the dominant sector in the financial system of Bangladesh. Banking system of Bangladesh comprises of four categories of scheduled Bank, i.e., state-owned commercial banks (SCBs), state-owned development financial institutions (DFIs), private commercial banks (PCBs), and foreign commercial banks (FCBs). Presently, six SCBs, two DFIs, thirty nine PCBs, and nine FCBS are operating in Bangladesh through 9131 branches with total number of banks 56 (Appendix).

Commercial banks in Bangladesh earn profits for their shareholders and at the same time satisfy the withdrawal needs of its customers and meet the demand of regulatory requirement (i.e., maintain CRR and SLR set by the Bangladesh Bank). However, banks' day to day required liquidity can be decided within their demand-supply framework (Appendix Table-1).

Against this background, the paper examines the relationship by using panel data and apply fixed effect model (FEM). In our study four types of banks (SCBs, PCBs, FCBs and DFIs) were taken into consideration for the period 1997-2014. The yearly data have been collected from various issues of Economic Trends, Annual Report, Bangladesh Bank Quarterly, Financial Stability Report, Scheduled Banks Statistics, Major Economic Indicator of Bangladesh Bank and Bangladesh Economic Review, Ministry of Finance.

The rationale for using this period is that after the expiry of FSRP (Financial Sector Reform Project) in 1996, the Government of Bangladesh has formed Banking Reform Committee to evaluate the situation in the banking sector. Besides, Commercial Bank Restructuring Project (CBRP) was undertaken to take progress on key issues and urgent actions needed for the development of commercial banks in 1997. Meanwhile, an international standard-based audit of the loan portfolio, assets/ liabilities and capital adequacy was formed in all banks in order to make full and proper disclosure of their financial position .

4 Liquidity position of the scheduled banks =Total liquid assets (cash in tills+ balance with Sonali bank+ balance with BB+ unencumbered approved securities)+ Required liquidity (SLR).

Apart from this, the definition of bank group had been changed in 2015. The paper finds a negative relationship between excess liquidity and expenditure-income ratio, and profitability.

The remainder of the paper is organized as follows: Following the introduction in section I, review of literature is given in section II. Section III gives a detailed scenario of liquidity and profitability in the commercial banks in Bangladesh and section IV analyses model specification, variable definition and methodology. Section V describes the estimated results . Finally, section VI gives a conclusion.

Section II: Review of Literature

Literature indicates that many studies have been taken on the relationship between liquidity and profitability in the banking industry. These studies show that the relationship between liquidity and profitability is not conclusive. Some papers find no significant relationship between liquidity and profitability. These include Junaidu et al. (2014) for Nigeria for the period 2003-2012 and Afia et al. (2014) for Bangladesh for the period 2006-2011. On the contrary, papers that find a positive relationship include Wambu (2013) for Kenya during 2008-2012, Munther et al. (2013) for Jordanian for the period 2005-2011 and Andrew et al. (2013) for Nigeria ".

Junaidu et al. (2014) examines the impact of liquidity on the profitability of Nigerian banks for the period 2003-2012. They used ROA and ROE as dependent variable. On the other hand, bank liquidity is measured by using ratio of loans and advances to total assets, and cash and bank advances to total liabilities, which are used as independent variable. A linear regression model estimated in the analysis. They find that there is a positive relationship between ROA and (cash and bank balances to total liabilities) and ROE (return on equity) and CBTOTL but negative relationship between ROE and LATOTA (Loans and advances to total assets). Finally, they find that there is no significant impact between liquidity and profitability among the listed banking firms in Nigeria. Afia et al. (2014) examines the liquidity-profitability relationships for the banking industry of Bangladesh by using yearly data from 2006-2011. They find no significant relationship between liquidity and profitability in this industry (Government bank, Islamic bank, private commercial bank, and multinational bank). They use only two variables i.e, liquidity (current ratio) and profitability (ROA). Therefore their results may suffer from omitted variable bias.

Wambu (2013) explores the relationship between profitability and liquidity of 44 commercial banks in Kenya during 2008-2012. The study used descriptive statistics and regression analysis to establish the relationship. In the regression analysis, the paper uses current ratio and CBK liquidity ratio which is the percentage of net liquid assets as a proportion of net deposit liabilities as an independent variable. The paper concludes that although profitability and liquidity have a positive relationship, liquidity is not a significant determinant of commercial bank’s profitability.

Munther et al. (2013) investigates the impact of liquidity on Jordanian banks profitability through return on assets for the period 2005-2011. They use the simple regression for the period from 2005 to 2011, to investigate the impact of liquidity through quick ratio on profitability through return on asset (ROA). Their study revealed that there is significant impact of quick ratio on ROA at 5 percent level of significant.

Andrew et al. (2013) examines the efficacy of liquidity management and banking performance in Nigeria. The research was survey based for the year 2012. For analysis purpose they used Pearson product-moment correlation coefficient. They find that there is a significant relationship between efficient liquidity management and banking performance and efficient liquidity management enhances the soundness of banks.

The above mentioned studies explain the relationship between liquidity and profitability in the banking sector in different countries. Most of these papers use only two variables, but there are numerous variables (bank specific and macroeconomic) that can influence the bank's profitability. However, there is a dearth of studies examining this issue in the context of Bangladesh. To fill this gap we have undertaken this empirical study. In Bangladesh the recent financial scam (Hall Mark and BASIC Bank) and huge loan default erodes the asset quality which impact on profit earnings of the banking sector. Besides, it not only impacts profit earnings but also banking sectors resilience and stability. Maintaining stability and profitability of the banking sector are now the major concern for the policy makers of Bangladesh. It is our believe that the findings of the paper gives some thought to the policy makers of the banking industry of Bangladesh.

Section III: Liquidity and Profitability Scenario in the Commercial Banks in Bangladesh

Measurement and Indicator of Liquidity

Bank liquidity means the ability to meet cash, cheques, other withdrawals obligations immediately and legitimate new loan demand while abiding by existing reserve requirements (Obilor Ibe 2013). Maintaining sound liquidity position is one of the significant indicators of better performance of a bank. Without ensuring the adequate liquidity the banking sector will fail to mobilize its resources for earnings profit.

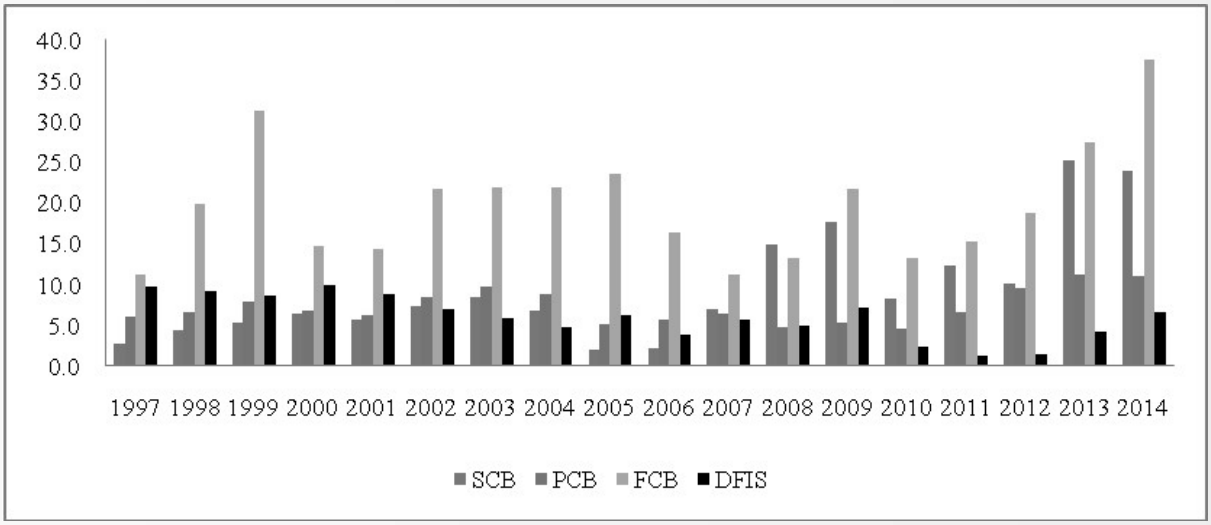
Chart-1shows that during 1997-2009 excess liquidity ratio demonstrate mixed trend for all groups of banks[5]. In case of DFIs excess liquidity was lowest during 2010-2012. All other three groups exhibit upward trend after 2010 may be due to BB has taken some measures

5 Excess liquidity ratio=percent of excess liquidity in total liquidity.

6 In order to maintain ensuring good corporate governance in banks for overcoming liquidity and solvency problems caused by poor governance, BB initiated two Basel III-liquidity standards, namely the Liquidity Coverage Ratio (LCR) and the Net Stable Funding Ratio (NSFR) to the banks as a reporting requirement in 2011. In addition, BB introduced a liquidity monitoring tool named 'Interbank Transaction Matrix' covering all the banks and NBFIs with a view to assessing the risk arising from the liquidity interdependence and placements among the institutions in the banking system.

to improve liquidity position in the banking sector[6]. It is also observed from the table that FCB hold the highest liquidity ratios followed by the SCBs in 2014.

Chart-1: Trends of Excess liquidity Ratio during 1997-2014



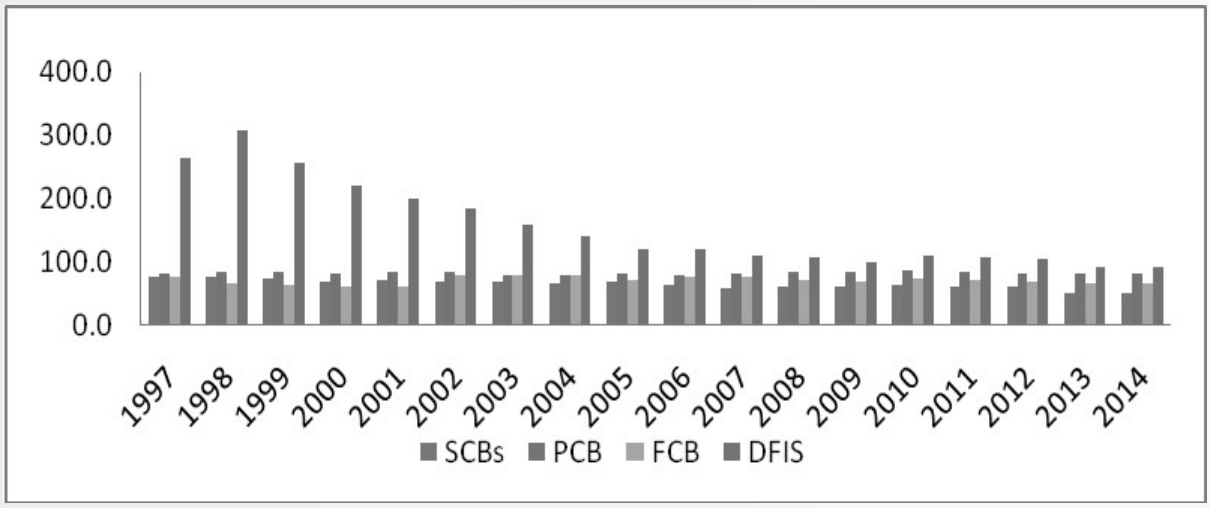
Source: BB Annual Report, (various issues).

Credit and deposits growth play an important role in the liquidity position in the banking industry. The demand of credit /advances depends on many factors, i.e., expected GDP growth, corporate earnings, inflation rate, interest rate of lending, and money supply target by the monetary authority[7]. Accordingly, deposits growth also depends on many factors, i.e., expected personal income (per capita income), trend of yield in money market deposits, and inflation.

Regarding this, the advance-deposit ratio (ADR) is one of the most useful indicators of adequacy of banks' liquidity[8]. The higher ratio of ADR indicate a stress in the banking system and a low level of liquidity to respond to shocks (Evans et al. 2000). The lower ratio of ADR, indicates an increasing ability of the banking system to mobilize deposit to meet credit demand. Banks may earn higher profit by increasing the ADR although it indicates lower liquidity. Bangladesh Bank is currently measuring the ADR ratio as a gross measure to calculate the liquidity condition prevailing in the banking sector[9].

Chart-2 shows that ADR of DFIs demonstrate downward trend after 1998-2014. The ADR of PCB shows more or less same during 1997-2014. On the other hand, ADR of FCB and SCBs showed mixed trend during 1997-2010, afterwards, it demonstrated a declining trend till 2014. It is mentioned that the interbank money market faced some liquidity stress at the end of 2010 which continue throughout the year 2011. BB instructed the banks to maintain their ADR within a certain level.

Chart-2: Trend of ADR by Types of Banks during 1997-2014



Source: BB, SBS (various issues).

Fiscal performance also influences liquidity in banking industry. If government heavily borrow from banking system for deficit financing then banking system faces pressure of liquidity and it would create an extra burden to the banking sector by creating liquidity shortage. So, government borrowing from the banking system is another indicator of liquidity situation. Chart-3 demonstrates that from government borrowing from the banking system was started to increase from 2008 (except 2010 due to prevailing liquidity crisis in the banking sector) and after 2010, it increased significantly when there was huge liquidity crisis in the banking sector. A rising trend of credit to the Government by the banking system may create strain on the lending capacity of scheduled banks to the private sector.

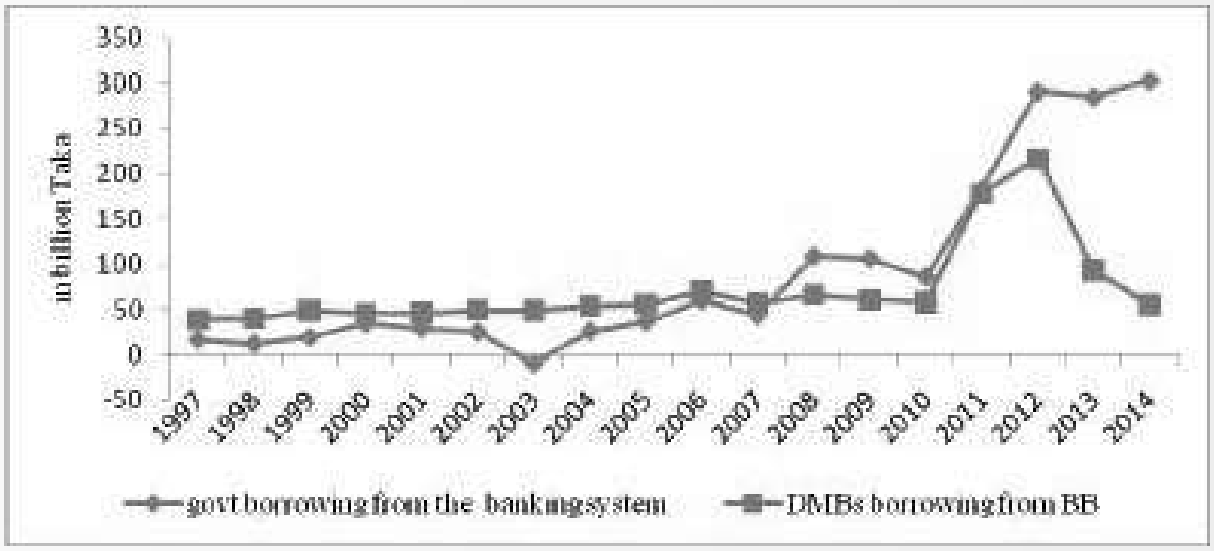
On the other hand, an increase in central bank credit to banks and other financial institutions often reflects liquidity situation in the financial system (Evans et al. 2000). It is observed from Chart-3 that banks borrowing from BB showed a steady trend during 1997-2010. An increasing trend was exhibited after 2010 which indicate liquidity crisis in the banking sector and it started to decline after 2012.

7 Credit= Advances + Bills+ Investment

8 Deposit are the main sources of funding for the banking sector in Bangladesh in addition to the capital, reserves and borrowings. Banks mainly use their funds to provide loans and invest in debt securities. The ADR, is, therefore, a useful indicator of banks' liquidity in Bangladesh.

9 ADR is the ratio of total advance to total deposits, where advance comprise all banking advance except interbank advances and inland and foreign bill purchases when these bills are funded.

Chart-3: Trend in Liquidity Indicator in the Banking System during 1997-2014



Source: BB Annual Report, Economic Trends, and Bangladesh Economic Review, Ministry of Finance (various issues).

Interbank money market is an important indicator for evaluating liquidity position in the banking sector. Investment in call money market decreased by 11.61 percent while, borrowings increased by 30.96 percent in 2010 compared with 2009 (Table-1). However, investment in call money market increased dramatically by 191.5 percent while, borrowings from call money market increased by only 41.5 percent in 2011 compared to that of 2010. It is noteworthy that the interbank money market faced liquidity stress throughout the year 2011. The stress was released in 2012 as more banks improved their ADR. Interbank call money rate and interbank repo rate are also important indicators for evaluating liquidity position in the banking sector. The prevailing very low ADR, decreasing call money rates and repo rates indicates that banking industry is currently having substantial liquidity (Table-1).

Table-1: Trends in the interbank money market developments

	CY09	CY10	CY11	CY12	CY13	CY14
Borrowings (in billion Taka)	121.98	159.75	226.2	316.0	221.6	244.9
Investment (in billion taka)	49.70	43.93	128.1	66.8	46.5	63.32
Call money rate	4.39	8.06	11.16	12.82	7.78	7.93
Repo rate	4.5	5.5	7.25	7.75	7.25	7.36

Source: Note: CY= calendar year, BB Financial Stability Report (various issue).

Measurement of Profitability

A bank will be profitable when its total revenues exceeds its relevant expenses (Niresh, 2012). Strong earnings and profitability profile of a bank reflect its ability to support present and future sound operation, absorb future contingent shocks and strengthen resilience capacity. A low profit would suggest ineffective management and investors would be hesitant to invest in the bank. More specifically, strong earnings influence the capacity to absorb losses by building an adequate capital base, finance its expansion and pay adequate dividends to its shareholders.

There are various indicators to measure profitability in the banking industry. The common indicators are return on asset (ROA), return on equity(ROE), non interest margin, and net interest margin (NIM)[10]. ROA is primarily an indicators of managerial efficiency and it indicates how capable the management of the banks has been converting the institution's asset into net earnings. ROE measures the rate of return flowing to the bank's shareholder. The NIM measures how large a spread between interest revenues and interest costs management able to achieve by close control over the bank's earning assets and the pursuit of the cheapest sources of funding.

Table-2 reveals that the ROA of the state owned commercial bank (SCBs) was less than banking industry average. During 2008-2011, it showed increasing trend, but it declined to -0.6 percent in 2012 due to huge net loss. In 2013 the ROA of SCBs increased and became positive at 0.60 but eventually turned into negative at the end of 2014. The DFIs situation is not getting better due to persistent operating losses incurred by Bangladesh Krishi Bank (BKB) and Rajshai Krishi Unnayan Bank (RAKUB). The ROA of DFIs deteriorated more scoring negative (-0.7 percent) in 2014. The ROA of PCBs showed a consistently strong position up to 2010, but it slightly dropped in 2011 and 2014 due to a decrease of net profit. Though ROA of foreign banks (FCBs') has been consistently strong during the last couple of years, it decreased slightly in 2013 and again increased in 2014 (Table-2). The recent rising in NPL also impact on ROA because high NPL gives huge stress in the banks to earn profit (Appendix Table-2).

10 ROA=net income after taxes/total asset. ROE=net income after taxes/total equity capital. NIM=net income after taxes/total income.

Table-2: Trend in Return on Assets (ROA) by Types of Banks

Year/Bank Type	SCBs	DFIs	PCBs	FCBs	Total
1997	0.00	-2.10	1.10	4.80	0.30
1998	0.00	-2.80	1.20	4.70	0.30
1999	0.00	-1.60	0.80	3.50	0.20
2000	0.10	-3.70	0.80	2.70	0.00
2001	0.10	0.70	1.10	2.80	0.70
2002	0.10	0.30	0.80	2.40	0.50
2003	0.10	0.00	0.70	2.60	0.50
2004	-0.10	-0.20	1.20	3.20	0.70
2005	-0.10	-0.10	1.10	3.10	0.60
2006*	0.00	-0.20	1.10	2.20	0.80
2007*	0.00	-0.30	1.30	3.10	0.90
2008	0.70	-0.60	1.40	2.90	1.20
2009	1.00	0.40	1.60	3.20	1.40
2010	1.10	0.20	2.10	2.90	1.80
2011	1.30	0.10	1.60	3.20	1.50
2012	-0.60	0.10	0.90	3.30	0.60
2013	0.60	-0.40	1.0	3.0	0.90
2014	-0.55	-0.68	0.99	3.4	0.70

Source: BB Annual Report and Bangladesh Bank Quarterly (various issues),. * Due to provision shortfall NIAPT (net income after provision and taxes) of 4 SCBs are administratively set at zero. Therefore, ROA for the 4 SCBs are zero.

Table-3 represents the aggregate net interest income (NII) of the industry, which increased constantly from Taka 6.3 billion in1997 to Taka 274.2 billion in 2014[11]. In 2013, NII of the industry fell down to Taka 132.3 billion reflecting mainly in the negative NII of Taka 5.4 billion by the SCBs (Table -3). The NII of the SCBs was a negative amount of Taka 1.2 billion in 2000 and it turned to positive (Taka 7.7 billion) in 2005. In 2001, the NII of SCBs was Taka 14.9 billion. Since 2005, SCBs have been able to increase their net interest income (NII) by reducing their cost of fund up to 2011. In 2012, the NII of SCBs dropped and in 2013 it was negative due to higher interest expenses which grew faster than interest earnings. In 2014, NII of SCBs stood at 39.7 billion Taka. This increase in NII was mainly due to investment income is take into account in the interest income from this year and BASIC bank and BDBL include in SCBs.

11 NII is the difference between (a) interest payments the bank receives on loans outstanding and (b) interest payments the bank makes to customers on their deposits.

Table-3: Net Interest Income (NII) by type of Banks (in billion Taka)

Year	SCBS	DFIS	PCBS	FCBS	TOTAL
1997	2.7	-0.1	1.7	2	6.3
1998	2.2	0.5	2.3	2.2	7.1
1999	3.1	-0.1	3	1.8	7.8
2000	-1.2	1	6.1	2.5	8.4
2001	-1.8	2.7	9.2	3.3	13.4
2002	-1.5	1.4	10.2	3.4	13.5
2003	-0.3	1.3	12	3.6	16.6
2004	-1.1	1.8	13.7	4.2	18.3
2005	7.7	1.0	21	5.6	35.3
2006	9	1.7	25.4	8.2	44.3
2007	7.4	1.4	36.1	9.9	54.8
2008	7.9	1.9	48.5	12.6	70.9
2009	12.1	1.9	56.7	10.7	81.5
2010	19.8	6.2	82.8	13.0	121.9
2011	34.3	4.9	91.4	16.1	146.7
2012	14.9	4.7	114.7	19.6	153.8
2013	-5.4	3.8	118.2	15.8	132.3
2014	39.7	2.1	205.8	26.6	274.2

Source: BB Annual Report (various issues).

Commercial banks in Bangladesh continuously monitor their balance sheet (assets and liabilities) for balancing liquidity and risk to maximize their profitability. Banking sector aggregate balance sheet data are given in Appendix Table-4.

Section IV: Model Specification Variable Definition and Methodology

a. Model Specification

Since the paper examines the relationship between liquidity and profitability of the commercial banks in Bangladesh, we employ the following empirical model:

$$Yt=\beta 0 + \beta i\ Xit + \varepsilon it$$

Where Yt denotes bank group-wise ROA which is measured profitability, Xi includes a set of bank specific control variables (excess liquidity ratio, expenditure-income ratio, interest rate spread, non-performing loans). $\beta 0$ is intercept and βi is the parameters and εi is the error term. In our model we used ROA as profitability indicator rather than ROE and NIM. ROA shows the capability of bank management for converting the total assets into net earnings. It is one of the most widely used profitability ratios because it is related to both

profit margin and asset turnover, and shows the rate of return for both creditors and investors of banks. ROE measure the rate of return flowing to the banks' shareholders. On the other hand, NIM shows how well the management and staff have been able to keep the growth of revenues ahead of rising costs. We believe that ROA is the best indicator for measuring the profitability in Bangladesh due to availability and accuracy of data. Although macroeconomic variables like GDP, inflation and interest rate impact on bank's profitability, we excluded those variable in the model because, these variables are same for all groups of banks and do not support estimating FE model in panel data. This is another limitation of the study.

b. Variable Definition

Return on Asset (ROA): ROA is net income after taxes/total asset. It indicates how capably the management of the bank has been converting its assets into net earnings.

Interest Rate Spread: Difference between weighted average lending rates and weighted average deposit rate in the commercial banks are taken for analysis. The relationship between profitability and interest rate spread probably positive.

Excess Liquidity-Ratio: Percent of excess liquidity in total liquidity. It is expected to be negative relationship with profitability.

Expenditure -Income Ratio: Expected to be negative relationship with profitability.

Non-Performing Loans (NPL): Gross NPL to total loan. High NPL signify high non-earnings asset which expected to be negative relationship with profitability.

c. Data and Methodology

In the study, four types of banks (SCBs, PCBs, FCBs and DFIs) were taken into consideration. The study uses secondary data for the period 1997-2014. The yearly data have been collected from Economic Trend, Annual Report, Bangladesh Bank Quarterly, Financial Stability Report, Scheduled Banks Statistics, Major Economic Indicator of Bangladesh Bank and Bangladesh Economic Review, Ministry of Finance.

The paper uses panel data to test the model. Wooldridge (2003) contends, “in many applications, the whole reason for using panel data is to allow the unobserved effect [i.e., ε i] to be correlated with the explanatory variables. There are several estimation techniques to address these problems. The two most prominent are (1) the fixed effects model (FEM) and (2) the random effects model (REM). If it is assumed that if εi and the X’s are correlated, FEM may be appropriate whereas if εi and the X’s are uncorrelated, REM may be appropriate, (Gujarati, 2004). A test was developed by Hausmann (1978) can be used to decide between FEM and REM. The null hypothesis underlying the test is that the FEM and REM estimators do not differ substantially. The test statistic developed by Hausman has an asymptotic $\chi 2$ distribution. If the null hypothesis is rejected (significant), the

conclusion is that REM is not appropriate. In our study chi square (X2) is significant at 1% level. So we use fixed effects model (FEM) for investigate the relationship.

V. Analysis of the Estimated Results

Table-4 represents the descriptive statistic of the all variables. The mean of all variables show a historical trend value during the period 1997-2014. The standard deviations, measures the volatility, showed a variation during the period 1997-2014. It is observed that standard deviation for expenditure-income ratio is 23.86 which showing more volatile than other variables. A volatility of expenditure-income ratio raises portfolio risk and erodes capital base of the banks which affects banks profitability. Moreover, the volatility is observed in NPL and excess- liquidity ratio also impact on banks profitability.

Table-4: Descriptive statistics of all variables

variable	Mean	S. D
Excess liquidity Ratio	10.61	7.50
Expenditure-income ratio	88.64	23.86
Interest rate spread	5.8	1.97
Non Performing Loan	21.10	18.35
Return on Asset	0.98	1.60

Source: Authors' calculation.

Table-5 gives a picture of the correlation between explained and explanatory variables. The correlations of ROA with expenditure-income ratio, NPL and interest rate spread are significant. The significant and negative correlation between ROA and NPL implies that high NPL decreases ROA. The estimated results also show that correlation between expenditure-income ratio and ROA is -0.88 which indicates that prevailing high expenditure-income ratio reduces ROA.

Table-5: Estimate results of Correlation among ROA and bank specific variables

	Variable	Correlation	t-Statistic
ROA	Excess liquidity Ratio	0.56	5.62
ROA	Interest rate spread	0.66	7.30
ROA	Expenditure-income ratio	-0.88	-14.57
ROA	Non Performing Loan	-0.81	-11.47

Source: Authors' calculation based on available data.

Table-6 shows the results of the impact of liquidity on banking sector profitability on the basis of FEM. Estimated results show that the banking sector profitability is affected by excess liquidity ratio and expenditure-income ratio. The coefficients of excess liquidity ratio and expenditure-income ratio are statistically significant with expected sign. Estimated results demonstrate that the coefficient of expenditure-income ratio is -0.04 implying that if expenditure-income ratio increase by one unit, ROA decrease by 0.04 unit. On the other hand, the coefficient of excess liquidity ratio is 0.03 with expected sign. This denotes that if excess liquidity ratio increase by 1 unit, profit decrease by 0.03 unit. The estimated coefficient of interest rate spread is -0.16 which is unexpected sign and statistically not significant. Although there is a positive relation between interest rate spread and profitability, statistically insignificant results implying other variables fitted more than interest rate spread during the sample period.

Table-6: Results of the Panel Regression Model: Dependent variable ROA (Fixed effect Model)

Variable	Coefficient	t-statistic
Interest rate spread	-0.16*	-1.69
Expenditure -income ratio	-0.04***	-9.1
Excess - liquidity ratio	-0.03**	-2.51
Non Performing Loan	0.02	1.45
Hausman Test (H 0 : No differences in coeffients)	Chi ^{2}= 75.01 Prob(0.000)	
Number of observation	72	
Adjusted R^2	0.92	
F-statistic	119.40 Prob(0.0000)	
Fixed Effects	Cross section	

Note:*** indicates significant at the 1% level. ** indicates significant at the 5% level. * indicates at 10% level of significant. Source: Authors' calculation.

VI. Conclusion

The main objective of this paper was to examine the relationship between banks' liquidity and profitability. In our study four types of banks (SCBs, PCBs, FCBs and DFIs) were taken into consideration for the sample period 1997-2014. By using panel data model we find a negative relationship between excess liquidity and expenditure-income ratio and bank's profitability. Liquidity and profitability are two crucial issues for commercial banks in Bangladesh. Excess liquidity indicates idle funds that don't bring any profit. On the other hand, insufficient liquidity might deteriorate bank's credit and that might lead to forced

liquidation of banks assets. So it is a major concern of banks authority to focus more on liquidity management for bank's profitability. The analysis of the estimated results show that the expenditure-income (EI) ratio negatively impact on bank's profitability. Available data show that (Appendix Table-5) EI ratio of the DFIs was the highest. The EI ratio of SCBs also high but it is decreasing in trend, mainly due to high administrative and operating expenses. Thus commercial banks should give attention to adopt rational expenditure policy for improving EI. However, our analyses of the relationship between liquidity and profitability is bank group-wise which is the limitations of the study. It is finally recommended that further research will be left on the same area extensively by using individual bank's data.

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Appendix

Scheduled Banks Operating in Bangladesh

A. State owned commercial banks (SCBs):

1. Agrani Bank ltd.
2. Janata Bank Ltd
3. Rupali Bank Ltd.
4. Sonali Bank Ltd.
5. Bank of Small Industries and Commerce Bangladesh Ltd.
6. Bangladesh Development Bank Ltd.

B. Speciallized Bank/Development Financial Institutions (DFIs)

1. Bangladesh Krishi Bank
2. Rajshahi Krishi Unnayan Bank.

C. Private Commercial Banks (PCBs):

1. AB Bank ltd.
2. Al-Arafah Islami Bank Limited
3. Bangladesh Commerce bank Ltd.
4. Bank Asia ltd.
5. BRAC Bank Ltd.
6. Dhaka Bank ltd.
7. Dutch Bangla Bank Ltd
8. Eastern Bank Ltd.
9. Export Import (EXIM) Bank of Bangladesh ltd.
10. First Security Islami Bank ltd.
11. International Finance Investment and Commerce Bank ltd.

12. Islami Bank Bangladesh Ltd.
13. ICB Islamic Bank Ltd.
14. Jamuna Bank Ltd.
15. Mercantile Bank Ltd.
16. Meghna Bank Ltd.
17. Midland Bank Ltd.
18. Modhumoti Bank Ltd.
19. . Mutual Trust bank Ltd.
20. National Bank Ltd.
21. National Credit and Commerce Bank Ltd
22. NRB Bank Ltd.
23. NRB Commercial Bank Ltd.
24. NRB Global Bank Ltd.
25. One Bank Ltd.
26. Prim Bank Ltd.
27. Pubali Bank Ltd
28. Shahjalal Islami Bank Ltd.
29. Social Islami bank Ltd.
30. South Bangla Agriculture and Commerce bank Ltd.
31. Southeast Bank Ltd.
32. Standard Bank Ltd.
33. The City Bank ltd.
34. The Premier bank ltd.
35. The Farmers Bank Ltd.
36. Trust Bank Ltd.
37. United Commercial Bank Ltd.
38. Uttara Bank Ltd.
39. Union Bank Ltd.

D. Foreign Banks

1. Bank A-Falah Ltd.
2. Citi Bank N.A
3. Commercial Bank of Ceylon Ltd.
4. Habib Bank Ltd.
5. National Bank of Pakistan
6. Standard Chartered bank
7. State Bank of India
8. The Hong Kong & Shanghai Banking Corporation ltd.
9. Woori Bank

Table-1: Sources of Demand and Supply for Liquidity within the Bank

Supplies of Liquid Funds Come From:	Demands for Bank Liquidity Typically Arise From:
Incoming customer deposits	Customer deposit withdrawals
Revenues from the sale of nondeposit services	Credit requests from quality loan customers
Customer loan repayments	Repayment of nondeposit borrowings
Sales of bank assets	Operating expenses and taxes incurred in producing and selling services
Borrowing from the money market	Payment of stockholder cash dividends

Source: Peter S. Rose,(2002).

Table-2: NPLs (%) of the Banking Sector by types of Banks

Types of Banks	1997	2000	2003	2006	2009	2010	2011	2012	2013	2014
SCBS	36.57	38.56	29	22.9	21.4	15.7	11.3	23.9	19.8	22.23
DFIS	65.72	62.56	47.4	33.7	25.9	24.2	24.6	26.8	26.8	32.8
PCBS	31.42	22.01	12.4	5.5	3.9	3.2	3	4.6	4.5	5.0
FCBS	3.58	3.38	2.7	0.8	2.3	3	3	3.5	5.5	7.3
Total	37.5	34.9	22.1	13.2	9.2	7.1	6.2	10	8.9	10.8

Note: NPLs= gross nonperforming loans to total loans, Source: BB, Annual Report.

Table-3: Movements in Interest Rate Spread

Period	SCBs	DFIs	PCBs	FCBs
2001	6.03	5.06	7.55	8.23
2002	6.15	5.92	7.05	7.4
2003	5.77	4.71	6.55	7.32
2004	4.87	3.7	5.54	7.45
2005	5.41	3.66	5.07	7.87
2006	5.63	3.18	5.44	8.12
2007	5.95	2.95	5.7	8.83
2008	3.96	3.12	4.7	9.33
2009	3.47	2.7	5.29	9.26
2010	4.18	2.26	5.38	8.82
2011	5.01	2.16	5.37	8.89
2012	4.06	2.73	5.51	8.76
2013	3.66	3.06	5.34	8.59
2014	3.71	1.68	5.94	7.92

Source: BB, SBS.

Table-4: Banking sector aggregate balance sheet in Bangladesh (In Billion Tk)

Particulars					**Change (%)**	
	2011	**2012**	**2013**	**2014**	**2012 to 2013**	**2013 to 2014**
Property & Assets						
Cash in hand (including FC)	59.7	81.1	102.7	91.1	26.7%	-11.33%
Balance with BB & SB (including FC)	399.5	450.8	479.3	572.8	6.3%	19.5%
Balance with other banks &FIs	155.9	244.7	347.9	409.7	42.2%	17.8%
Money at call & short notice	128.1	66.8	46.5	54.2	-30.4%	16.4%
Investments						
Government	662.1	607.6	841.2	977.6	38.5%	16.2%
Others	131.3	505.9	730.0	855.5	44.3%	17.2%
Total Investment	793.4	1113.5	1571.2	1833.1	41.1%	16.7%
Loans & advances						
Loans, CC, OD ect.	3525.1	4098.4	4443.5	5147.2	8.4%	15.8%
Bills purchased & Disct.	267.5	288.2	276.6	245.7	-4.0%	-11.2%
Total Loans & advances	**3792.5**	**4386.7**	**4720.1**	**5392.9**	**7.6%**	**14.3%**
Fixed assets	143.7	162.1	198.2	216.7	22.3%	9.4%
Other assets	401.1	488.1	532.5	570.7	9.1%	7.2%
Non-banking assets	1.2	36.9	1.7	1.9	-95.4%	11.6%
Total Assets	**5874.9**	**7030.7**	**8000.2**	**9143.0**	**13.8%**	**14.3%**
Liabilities						
Borrowings from other banks/FIs/Agents	226.3	316.0	221.6	313.0	-29.9%	41.3%
Deposits &Other Accounts						
Current Deposit	992.9	989.6	1091.0	1295.3	10.3%	18.7%
Savings Deposits	933.7	972.6	1047.7	1225.6	7.7%	17.0%
Fixed/Term Deposit	2583.2	2985.6	3622.3	3931.1	21.3%	8.5%
Other Deposits	-	474.4	533.3	688.6	12.4%	29.1%
Total Deposits	**4509.8**	**5422.2**	**6294.3**	**7140.6**	**16.1%**	**13.4%**
Bill payable	65.3	76.0	68.9	87.8	-9.3%	27.5%
Other liabilities	546.4	640.6	737.2	860.2	15.1%	16.7%
Total Liabilities	**5347.8**	**6454.7**	**7321.9**	**8401.7**	**13.4%**	**14.7%**
Capital /Shareholders' equity	527.1	575.9	678.3	741.3	17.8%	9.3%
Total liabilities & Shareholders' Equity	**5874.9**	**7030.7**	**8000.2**	**9143.0**	**13.8%**	**14.3%**
Off-balance sheet items	1814.6	1871.3	2153.1	2360.95	15.1%	9.7%

Source: BB, FSR 2014.

Table-5: Movements of expenditure-income ratio

Year	SCBs	DFIs	PCBs	FCBs
1997	99.4	145.2	86.0	59.7
1998	99.8	175.3	85.3	60.1
1999	100.5	89.1	90.4	67.4
2000	99.4	95.9	90.8	77.7
2001	99	95.9	88.1	75.7
2002	98.5	101.1	91.9	78.3
2003	98.8	104.0	93.1	80.3
2004	102.3	103.9	87.1	76.3
2005	101.9	103.5	89.3	70.8
2006	100.0	107.7	90.2	71.1
2007	100.0	103.7	88.8	72.9
2008	89.6	103.7	88.4	75.8
2009	75.6	112.1	72.6	59.0
2010	80.7	87.8	67.6	64.7
2011	62.7	88.6	71.7	47.3
2012	73.2	91.2	76.0	49.6
2013	84.1	94.8	77.9	50.4
2014	83.3	112.0	75.8	46.5

Source: BB, Annual Report.