

**“Capital Adequacy, Asset Quality and Profitability
A Study on Conventional Banks in Bangladesh”**

By

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A thesis submitted to the Department of Economics and Social Sciences
in partial fulfillment of the requirements for the degree of
Master of Science in Applied Economics

Department of Economics and Social Sciences
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Spring 2026

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It is hereby declared that

1. The thesis submitted is for the completion of my Master's degree at BRAC University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

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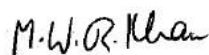
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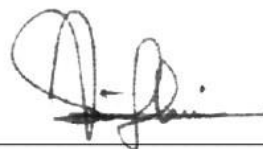
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Ethics Statement

Hereby, I Chowdhury Tahrima Afroze bearing the Id#18275006 a student of Economics and Social Sciences Department, BRAC University would like to declare that the work presented in this Thesis has not been submitted to any other University/College/Organization for an academic qualification/certificate/diploma/degree or has not been previously published elsewhere. The work I have presented here does not violate any existing copyright.

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Executive Summary

This study examines the relationship between capital adequacy and asset quality with profitability. Capital is main factor of banks and adequate capital works as the insurance and confidence factor for the banks. If NPL of banks increases, the cost of funding cannot be recovered. This increased cost of funding decreases the ROA, ROE, and NIM in Bangladesh. Provision kept due to increased NPL creates an obstacle in the case of lending, which ultimately decreases the profit. Profitability is also affected by bank size. It is easier for banks to achieve economies of scale if they have large asset size but incapability of achieving economies of scale will lower the profit of banks.

In this study a sample size of 20 conventional banks out of 34 have been selected covering the period 2009 to 2018. This study uses the capital adequacy ratio, equity to asset ratio, bank size, NPL to total loan, and loan loss provision to total assets as proxies for capital adequacy, and asset quality. Return on assets, return on equity and net interest margin are used as proxies for banks' profitability. Capital adequacy is considered as the main driver of many financial institutions. KMO and Bartlett's test, Descriptive Statistics, Analysis of Variance (ANOVA), Coefficient Analysis, Correlation analysis, Trend Analysis has been used in this study. For multiple regression analysis three regression models are developed. Equity to asset is positively related with ROA, ROE, and NIM. NPL to total loan, loan loss provision to asset have a negative impact on profitability. Though CAR and bank size are negatively related to ROA and ROE, they are positively related to NIM fulfilling the expected results and hypothesis.

Acknowledgement

I would like to present my heartfelt gratitude to Almighty Allah, for giving me the opportunity to build and complete my thesis report on **“Capital Adequacy, Asset Quality and Profitability: A Study on Conventional Banks in Bangladesh.”** At first from the beginning I was under the supervision of Dr. Iftekhar Ahmed Robin Sir for almost a year but due to some reason he had to leave BRAC University of which I was not informed. Then I was given under the supervision of Dr. Gazi Mohammad Hasan Jamil Sir. I am thankful to my supervisor Dr. Gazi Mohammad Hasan Jamil Sir for his kind supervision, direction, communication, and cooperation during the time of preparing the report. I am also highly indebted to Wasique Rahman Khan Sir (Professor and Chairperson of Economics department) for all his guidance and cooperation till the end of my thesis journey. Without Wasique Sir's support, it would have been very difficult for me to complete my Master's degree.

Lastly, my regards go to the authors of different research papers for providing required concepts and information on their papers in an organized way which helped me to find out the variables under capital adequacy and asset quality which have an impact on banks' profitability for my thesis report.

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List of Acronyms

1. CAR-Capital Adequacy Ratio
2. NPL- Non-Performing Loan
3. ROA- Return on Asset
4. ROE– Return on Equity
5. NIM- Net Interest Margin
6. ETA- Equity to Total Asset
7. ANOVA– Analysis of Variance
8. KMO- Kaiser- Meyer- Olkin (test)
9. CRAR- Capital to Risk-Weighted Asset Ratio
10. OECD- Organization for Economic Cooperation and Development
11. RWA– Risk-weighted Asset
12. CEE- Central and Eastern European
13. SPSS- Statistical Packages for Social Sciences
14. BASEL- Bayes And Simulation Equal Life
15. BB- Bangladesh Bank
16. DWT- Durbin Watson Test
17. IV- Independent Variable
18. DV- Dependent Variable

Chapter -01

Introduction

Banking is a process that is involved in many ways with the business and trade. There are different types of banking in the present world. Two major types are the Conventional Banking and the Islamic Banking. Conventional Banks (CBs) borrow money from depositors at a low interest rate and lend them to borrowers at a high interest rate. The conventional bank is profit-oriented, and its main purpose is to make a profit through interest for bearing risk. Whereas Islamic banks get money through profit and loss sharing, leasing, and charging for services. Islamic Banking (IB) is a contemporary segment of banking and finance that has become increasingly significant in many Muslim countries. In contrast, interest is forbidden in Islam and therefore Islamic banks enter into profit-sharing arrangements with both depositors and borrowers. The basic difference between these two is that conventional banks gain profit through interest and it is based on risk bearing concept, on the other hand, the concept of interest is absent in the Islamic Banks and it is based on risk sharing concept. For banks to protect depositors and to ensure financial efficiency and stability, maintaining CRAR or Capital Adequacy Ratio (CAR) is required.

The main reason for the capital shortfall of banks is the default of large loan borrowers. The non-performing loan rate of Bangladesh is higher than the international average. According to a survey, if the top 10 large borrowers become loan defaulters, then the 35 banks would fail to maintain the required CAR. The amount of tier 1 capital to risk-weighted assets was in decreasing trend in 2018. But banks were able to maintain the minimum requirement of 6%. Undercapitalized banks will run for short term borrowing in the tight money situation at high costs, which will reduce the profit further. Banks have significant control over the circulation of money. As a result, they have a significant role in the growth of the economy in Bangladesh. The failure of a single bank is considered as an economic distress situation and brings disaster for the whole economy. Capital is main factor of banks and adequate capital works as the insurance and confidence factor for the banks. ROA and ROE is the indicator of the company's management efficiency. Both of them indicate how the company's management works at generating profits through the best use of the resources. If the condition of ROA and ROE is not good or if they are decreasing, then it indicates that the company's management is not efficient enough to use the resources at its best.

The return of equity of banks in Bangladesh at the beginning of 2018 was 10.4% and at the end of the year 2018, it dropped to 4.4% which is shocking. Return on assets of Bangladesh at the beginning of 2018 was (0.7%) which also dropped to (0.3%) at the end of the year 2018. When NPL of banks

increases, the cost of funding cannot be recovered. This increased cost of funding decreases the ROA, ROE, and NIM in Bangladesh. In the first quarter of 2019, the amount of defaulted loan was 110873.54. The growth percentage of the non-performing loan is 18.06%. In September 2019, the nonperforming loan was 12% which was 11.7% in the previous quarter. Provision kept due to increased NPL creates an obstacle in the case of lending, which ultimately decreases the profit. Profitability is also affected by bank size. It is easier for banks to achieve economies of scale if they have large asset size but incapability of achieving economies of scale will lower the profit of banks. This means that the bank will face diseconomies of scale.

Profit is an essential factor for a bank to survive, to attract depositors and outside capital investment firms to help the bank through capital investment. So, Banks need to know the impact of key components on the profitability. It will help banks to foster those components that increase the profit and to control those components that create hinders on the way of increasing profit. Bangladesh is trying to foster its economy through the development of its technology-based banking sector to keep pace with the world economy.

1.1 Background of the study

The ability of a bank or other financial institution to settle its debts in the event that individuals or organizations are unable to repay the money they have borrowed from the bank is measured by its capital adequacy. The likelihood of a loan or lease defaulting is measured along with the asset's marketability to determine the asset quality. To put it another way, asset quality is a gauge of how much a bank or other financial organization can charge for a loan or lease, depending on the terms agreed upon by the borrower or lessee, particularly a bond issuer. In our analysis, the profitability indices that are used are ROA, ROE, and NIM. The role of commercial banks in Bangladesh's economic development is high.

Commercial banks: Certain banks, or divisions within banks, cater primarily to government, corporate, and nonprofit customers. Due of the size of their clientele, these banks are frequently referred to as business or commercial banks. Commercial banks frequently provide unique loan options and financing for companies. Commercial banks are divided into two parts. One is conventional and the other one is Islamic banks. It is found that interest-based conventional banks are outperforming interest-free Islamic banks due to their dedication to the economy and community, efficiency, profitability, and contribution to business developments (Safiullah, 2010). Compared to normal banks, Islamic banks are less competitive and more centralized.

Higher percentage of Return on assets indicates more efficiency of a company's management

at managing its balance sheet to generate profits. In other words, it is a ratio that shows how much profit a company can generate from its assets. A rising ROE refers that a company is increasing its profit generation without needing much capital. A higher NIM increases profitability of the lender.

1.2 Scope and Limitations of the study

Scope of the study

Capital adequacy and Asset quality are the two important pillars for any banks to survive and remain sustainable in this competitive era. This study is limited to the conventional banks of Bangladesh. Twenty (20) out of thirty-four (34) conventional banks named AB Bank, Bank Asia, IFIC Bank, National Bank, Pubali Bank, City Bank, UCBL, Uttara Bank, Dhaka Bank, DBBL, EBL, Prime Bank, NCC Bank, MTB, Mercantile Bank, One Bank, Jamuna Bank, Standard Bank, Premier Bank and Trust Bank are taken as the sample for this study. Data for 10 years (2009-2018) is collected for this study.

Limitations of the study

- 1) Twenty (20) banks are included in the sample size out of thirty-four (34) conventional banks due to the lack of data availability of the other banks.
- 2) Only the secondary sector (annual report of the Conventional Banks) is used as the data source.
- 3) No primary research is conducted.

To know the impact of capital adequacy and asset quality on profitability, the components of capital adequacy and asset quality are also being determined.

1.3 Rationale of the study

The banking sector of Bangladesh is now in a profitable trend to promote the economic growth of the nation. Bangladesh Bank, the central bank of Bangladesh, is adopting many principles and guidelines to regulate the banking sector properly. Bangladesh bank has taken certain responsibility to arrange punishment for those banks who do not oblige by the regulations of the BB. Bangladesh bank needs to regulate this banking sector in such a way that along with the motive of earning profit, this sector can also upgrade the economic standard of the nation.

Profit is the ultimate goal for banks. Banking industry needs to know those components that increase the profits of the bank and also those components that reduce the profitability of the banking sector. NPL is a common factor that reduces profitability. Banking sector must find out ways that will

reduce NPL through the proper repayment of the loan by the borrowers. It is necessary to know the impact and association of the bank's capital and asset quality with profitability so that banks can take proper measures to upgrade the level of profit. This will enable the banking sector to run the functions of the banks smoothly.

1.4 Objective of the study

- What is the main purpose of writing this paper?

The purpose of writing this paper is to analyze the impact of capital adequacy and asset quality on profitability (defined by ROA, ROE and NIM) of conventional banks in Bangladesh and to examine how the level of profit differs with a change in capital adequacy and asset quality factors.

- What the conventional banks need to do in order to control profitability?

It is urgent for conventional banks to undercut those factors that lead to a reduction in banks' profitability and should be more conscious about the factors that increase profitability. As the banking sector of Bangladesh is profit-oriented they should be more aware about the factors that increase or decrease profit.

In this study we have three DV (dependent variables)– ROA, ROE and NIM (indicators of profitability) and five IV (independent variables)– Capital Adequacy Ratio (CAR), Equity to Asset Ratio (EAR), Bank size, NPL to Total Loan and Loan Loss provision to Total Asset. Impact of these independent variables will be analyzed on the three dependent variables.

- For a growing economy like Bangladesh, it is urgent to lead the banking sector in a way so that banks can undermine those factors that reduce the profitability of the banks.

This chapter discusses about the introductory part, background, scope and limitations, rationale, objectives and methods of the study. The objective part is designed to give an overview of the whole paper.

Chapter -02

Literature Review

Conventional banks operate to generate profit and to promote the standard of the economy based on interest-based banking. There are a lot of articles regarding the capital adequacy, asset quality and profitability of banks of different countries. To have a clear concept about how capital adequacy and asset quality affects profitability it is necessary to see the research of different authors in summary.

2.1 Concept of Conventional Banks

There are two types of commercial banks in Bangladesh: one is interest-based conventional banks and another one is interest-free Islamic banks (Safiullah 2010). Banks that operate based on interest-based profits in the home country are defined as conventional banks. The financial performance of both banks is notable in terms of profitability, liquidity, efficiency, productivity and solvency.

There are 30 conventional PCBs in Bangladesh now but in the updated news it is found that 34 conventional private banks are operating in Bangladesh (Haque 2013). As new banks are adding day by day the banking sector of Bangladesh is growing continuously. Success or failure of this banking sector (which contributes 61% of the GDP) strongly affect the growth of the economy.

2.2 Capital Adequacy and Asset Quality

Banks having less than 8% of capital is considered undercapitalized. When the amount of capital is greater than or equal to 8% but less than 10% it is said to be adequately capitalized. If capital is greater than 10%, it is well-capitalized. For all undercapitalized banks, it is expected to have high delinquency rates in lending (Kishan and Opiela 2000).

Miu, Ozdemir, and Giesinger (2010) examined that economists and specialists reinforce in maintaining the quality capital and capital buffer to overcome any stressed situation after the financial crisis. The capital buffer works as the shock absorber in the stressed situation. Tier 1 capital is consisted mainly of common equity and retained earnings. In this study, it has been found that profitability is hurt in order to maintain the required surplus capital. Along with maintaining buffer capital a proper risk and capital management and higher quality capital is required.

Cohen and Scatigna (2016) analyzed that banks are required to maintain buffer capital due to the global financial crisis of 2007 to 2010. The adjustment for high required capital is not done through the adjustment in lending or assets but it was done by the procurement of retained earnings.

The Common Equity Tier 1 capital consists of paid-up capital, statutory reserve, general reserve, retained earnings, dividend equalization reserve, non-repayable share premium account. On the other hand, Tier 2 capital consists of general provisions, subordinated debt (Ojo 2014).

The effectiveness of higher capital ratios in decreasing risks and increasing the efficiency and effectiveness of Bank profitability is tried out through a regression model (Bitar, Pukthuanthong, and Walker 2018). For this a sample of 1992 banks were taken from 39 OECD (The organization for economic co-operation and Development) countries. The sheer requirement of capital is not the solution for this distress after the financial crisis of 2007-2010. That is why capital has been refined. In Basel III it has been said that minimum Tier 1 capital needs to be held at 6% where 4.5% will be the common equity Tier 1 capital and the rest 1.5% will be the additional Tier 1 capital. The percentage of tier 1 capital is calculated by dividing the Tier 1 capital by the Risk-Weighted Assets (RWA). It is said that holding higher capital can decrease profitability. A needed higher liquid ratio and net funding ratio decreases the profitability of banks according to Basel III.

To quantify the credit risks related to financial institutions' operations, asset quality evaluation is necessary. A panel regression model was used to conduct a study on 15 commercial banks in Nigeria from 1980 to 2013 to look into the relationship between asset quality and profitability. NPL to total loan, loan loss provision to total asset, loan loss provision to total loan, and NPL to total customer deposit are the independent variables for asset quality. NPL to total loan and loan loss provision to total asset have a negative association, however it is not statistically significant on its own. Return on Investment, the dependent variable, was not significantly correlated with any of the four independent variables that were employed. Nonetheless, it has been demonstrated that the ANOVA table's p-value was less than .05, indicating that the independent variables taken together significantly affect profitability (Lucky and Nwosi, 2015).

2.3 Profitability

The Return on Assets (ROA) and Return on Equity (ROE) is defined as banks' profitability (Mathuva 2009). To show the impact of capital and cost-income ratio on profitability a regression model covering the period 1998 to 2007 has been used. In the correlation analysis, it has been found that the relationship between independent and dependent variables is not so strong but most of them are significant. For the dependent variable ROA five regression models were used. Among them the

adjusted R squares were near to 10% or below 10% for four models. The adjusted R square was near to 45% for only one model. For ROE, the adjusted R Square was near to 20%, and 45%. (Mathuva, 2009).

Awdeh and El Moussawi (2009) examined the determinants of commercial banks' net interest margin covering the period 1996-2009. The efficiency of financial institutions is measured by the interest rate margin. The deposit growth rate is positively related to Net Interest Margin. This is because it is said that banks due to the high reputation may obtain deposits at a lower rate. Capital is negatively related to the net interest margin as higher capitalized banks tend to pay a higher rate to depositors to increase the deposited funds and lowers the loan rate to increase the customer base. Loan is positively related to a bank's net interest margin as banks with high demand for loans have the pricing power over the borrower which increases their net interest margin.

Profitability is defined in terms of Return on Assets covering the period 2009 – 2012. A study was done based on twenty-three commercial banks where capital adequacy and bank size were defined as independent variables (Dawood 2014). The study found that capital adequacy has a significant positive impact on profitability whereas bank size has an insignificant positive impact on profitability.

2.4 Capital adequacy, Asset Quality, and Profitability

Bitar, Pukthuanthong, and Walker (2018) found that higher capital ratios for highly liquid banks have a detrimental effect on profitability based on a sample of 1992 banks from 39 OECD countries covering the period 1999–2013.

Profitability and net interest margins are higher for banks with adequate capital (Demirguc-Kunt and Huizinga 1999). The interest margins and earnings of foreign banks in developing nations are higher than those of domestic banks. Gambacorta and Mistrulli (2004) showed that in the period of monetary policy tightening, there is a lack of bank deposits which cannot be recovered by the issuance of non-resolvable debts or liquidation of assets at a lower cost. The investors should be provided with more premiums. If there is enough capital in Bank it will act as a positive signal to investors and they will think positively about the creditworthiness of the bank. This will reduce the cost of non-resolvable funding (issuance of Bonds, CDs) for the high capitalized banks.

Due to the financial crisis, there is a stricter capital requirement according to Baker and Wurgler (2015). Higher and strict capital requirement increases the cost of capital. This is because strict capital means that the bank is less risky. Thus a large increase in capital via the low-risk facility increases the cost of capital.

According to a study on the effects of capital requirements on bank profitability and the cost of financial intermediation, which used a panel data set of 32 Bangladeshi banks from 2000 to 2015, higher bank regulatory capital ratios boost profitability and lower the cost of financial intermediation. Furthermore, increased capital requirements have a detrimental effect on banks' net interest margins but a favorable effect on their profitability (Rahman et al. 2017). The higher capital requirement was imposed on the banks according to Basel III due to the global financial crisis. The general and usual assumption after this was that the cost of capital would be enhanced for the borrowers and net profitability would be decreased. The Basel Committee on Banking Supervision agreed on a risk-based capital regulation named Basel accord 1 in 1988. Here credit risk and minimum capital regulation were analyzed. In 2004 Basel II was introduced and in 2010 Basel III was introduced by improving both the quality and quantity of capital requirements. Bangladesh bank adopted the requirement of capital for the bank by the capital regulation determined by Basel since 1996.

Through analyzing the secondary data of financial statements of 5 commercial banks for 5 years, it has been found that capital adequacy is positively related with profitability (Agbeja, O., Adelakun, O.J. and Olufemi, F.I. 2015). A regression analysis was used for this. The more a bank has capital the more will be the profitability. Banks with higher capital are considered to be safer and has more profitability. Deposit of more funds increases public confidence which enables the bank to meet customers' credit needs.

Căpraru and Ihnatov (2014) shown that capital sufficiency has a favorable effect on profitability through an analysis of 143 commercial banks in five CEE (Central and Eastern European) nations from 2004 to 2011. Larger capital adequacy banks yield larger profits. There is a negative correlation between Net Interest Margin (NIM) and bank size. The Net Interest Margin would be smaller the larger the bank. The financial statements of ten Turkish banks covering the years 2002 to 2010 were subjected to the panel data approach, which revealed that larger banks have better ROA and ROE (Anbar, A. and Alper, D. 2011).

Banks in high-income countries have a higher positive capital effect on ROE, and banks in low-income countries have a higher positive capital effect on profitability, according to research done using bank-level data for 42 Asian banks covering 2276 banks between 1994 and 2008 (Lee and Hsieh 2013).

Based on seven banks from the year 2011 to 2015 and defined in terms of ROA it has been showed that bank size does not have a significant impact on profitability (Parvin, Chowdhury, Siddiqua, and Ferdous 2019). There is also no strong correlation between Bank Size and ROA.

2.5 Literature gap

We have found that there is huge scope to work with the impact of capital adequacy and asset quality in the area of profitability for conventional banks. Variables of different studies differ. But we have selected 5 independent variables based on many literature review. Impact of these variables will be analyzed on three dependent variables named ROA, ROE and NIM which will add a new dimension in the area of conventional banks profitability.

Twenty (20) banks are included in the sample size out of thirty-four (34) conventional banks due to the lack of data availability of the other banks. Only the secondary sector (annual report of the Conventional Banks) is used as the data source. No primary research is conducted.

Based on literature review, it can be said that not only studies on capital adequacy, asset quality and profitability are adequate. There is a huge scope of study in this regard.

Chapter- 03

History & Different Generations of Banking Sector

Bangladesh is a developing country with an impoverished banking system, particularly in terms of the services and customer care provided by the government run banks. The History of Banking Sector in Bangladesh deals with two phase: Before Independence and After Independence.

3.1 Before Independence

Bank Name	Establishment Year
Bank of Hindustan	1770
General Bank of Bengal and Bihar	1733-1775
Bengal Bank	1784-1791
General Bank of India	1786-1791
The Commercial Bank	1819
The Calcutta Bank	1824
The Union Bank	1828
The Government Savings Bank	1833
The Bank of Mirzapore	1835
Dacca Bank	1846

Source- Wikipedia

The oldest still in operation in any capacity is the Bank of Calcutta, which was founded in 1806. After changing its name to Bank of Bengal in 1809, the Imperial Bank of India amalgamated with it in 1921, and in 1955 it was renamed the State Bank of India.

Dacca Bank was the first modern bank to be based in Dhaka, having been founded in 1846. It didn't print banknotes and conducted very little business. In 1862, Bank of Bengal acquired it. In 1873, Bank of Bengal established branches in Sirajganj and Chittagong; in 1900, they expanded to Chandpur. It had six subsidiaries in East Bengal in 1947 after Bengal was divided: Dhaka, Chittagong, Chandpur, Mymensingh, Rangpur, and Narayanganj. After the division, banks that were registered began to relocate their branches to India or cease operations in East Bengal. As a result, in 1951 there were only 69 branches remaining in East Pakistan.

Before gaining independence, Eastern Mercantile Bank Limited had 106 branches when it was founded in 1959. As a result, Eastern Banking Corporation was founded in 1965 and quickly expanded to 60 branches right before the liberation struggle. Several well-known Bengali businesspeople spearheaded the establishment of these two banks in order to give credit to local business owners who, at the time, had little access to credit from other West Pakistani financial organizations.

3.2 After Independence

When Pakistan gained independence in 1971, the country's banking sector included of seventeen sizable commercial banks, three of which were owned by foreigners other than West Pakistanis, and two branch offices of the erstwhile State Bank of Pakistan. Fourteen smaller commercial banks were present.

The majority of banking services were located in cities.

- The State Bank of Pakistan's Dhaka branch was quickly named the central bank and renamed the Bangladesh Bank by the newly independent government.

The bank was in charge of managing exchange control, the official foreign exchange reserves, credit and monetary policy, and currency regulation. The government of Bangladesh first nationalized the whole domestic banking sector before renaming and restructuring the several banks. It was allowed for foreign-owned banks to carry on operations in Bangladesh. Additionally, the insurance industry was nationalized and turned into a possible source of investment capital. Postal savings banks and cooperative credit systems provided services for modest individual and rural accounts. It was successful for the new banking system to set up procedures for managing foreign exchange and credit that were comparatively efficient. Throughout the 1970s, the public sector and trade accounted for 75% of all advances, making them the main beneficiaries of the credit system.

The People's Republic of Bangladesh's government nationalized the twelve banking companies that were operating in the country following its independence.

Nationalized Bank	Before Independence (The Twelve Banking Companies)		
Sonali Bank	National Bank of Pakistan	Bank of Bhawalpur	Premier Bank Limited

Rupali Bank	Muslim Commercial Bank	Australasia Bank Limited	Standard Bank Limited
Agrani Bank	Commerce Bank Limited	Habib Bank Limited	
Janata Bank	United Bank Limited	Union Bank Limited	
Pubali Bank	Eastern Mercantile Bank Limited		
Uttara Bank	Eastern Banking Corporation		

Source- Wikipedia

3.2.1 Banking in pre-British period: (From the 14th century)

Sometime around the year 1312 AD, a group of Muslim merchants from Kabul, known as the Kabuliwalas, traveled to India and began lending money in return for interest. During that time, Bengal's economy was greatly impacted by its native bankers, whose primary operations were transferring income and providing advances to the government. As institutional banking facilities began to open in the unbanked areas, their activity and significance gradually decreased over time.

3.2.2 Banking in British period (1846- 1947):

During that time, all extended banking facilities were fully owned by private companies. Dacca Bank, Dhaka's first contemporary bank in the European style, was established in 1846. The Bank of Bengal then opened two further branches at Sirajgonj and Chittagong, respectively, in 1873, after opening its first branch late in 1862 in the eastern region of Bengal (now Bangladesh).

However, those two branches were eventually shut down in 1877. It should be noted that in 1920, a special act combined the Bank of Bengal with two other banks (the Bank of Bombay, founded in 1840, and the Bank of Madras, founded in 1843) to form the Imperial Bank of India. The newly renamed Imperial Bank of India gradually expanded its branch network throughout Bangladesh, with offices opening in Dhaka (1862), Chittagong (1906), Mymensingh (1922), Rangpur (1923), Chandpur (1924), and Narayanganj (1926).

In Bangladesh, the total number of bank offices increased from 149 in 1921 to 668 in 1946. The increase of bank offices is directly related to the rise in the national income. However, following the 1946 political unrest and communal rioting, the upward tendency of bank office development was

abruptly reversed. As a result, up to 100 bank branches in Bengal, which was an independent state and most of which was in Bangladesh, were shut down.

3.2.3 Development of banking in Pakistani period (1947-1971)

Pakistan acquired "banking under private ownership" from British India; a sizable fraction of this banking was active in Bangladeshi territory between 1846 and 1971.

Following the relocation of head offices and the transfer of resources from then-East Pakistan to India by the non-Muslim majority who controlled the banking sector, the establishment of two independent dominions, India and Pakistan, in August 1947 dealt a severe blow to the banking system of what was then East Pakistan (now Bangladesh).

Just two of the twenty-five Pakistani scheduled banks were left to the eastern side of the country a year after partition in 1948, marking the first instance of economic inequality between the east and the west.

There was not another bank established in the eastern wing until 1959, when East Pakistani entrepreneurs established the Eastern Mercantile Bank, which had its headquarters in Chittagong, and the Eastern Banking Corporation, which had its headquarters in Dhaka, in 1965. Significant improvements in other financial indicators followed by a notable increase in bank deposits were the result of this.

Furthermore, in the Eastern Wing, the per capita deposit increased from 7.7 rupees in 1954 to 44.86 rupees in 1970. Even so, West Pakistan's per capita deposit was discovered to be 4.7 times more than that of the Eastern region prior to the start of the liberation war in early 1971. All of these unequivocally demonstrate the step-brotherly treatment from the Western wing that permeates every industry and ultimately ignited the powerful flame of the liberation war in 1971.

3.2.4 Development of banking in post liberation period. (Since 1972)

Following its independence, Bangladesh inherited a shaky banking sector made up of three foreign banks (with 14 branches), ten Pakistani banks (having 920 branches), and two Bangladeshi banks (with 155 branches). Following their resource transfer to Pakistan, the owners and senior executives of Pakistani banks operating in Bangladesh departed shortly after freedom.

This hampered the development of the nation's banking industry, which was already in precarious and unstable shape following freedom. A series of changes, including nationalization, denationalization, privatization, shariah-based Islamic banking, the Financial Sector Reform Project (FSRP), the Commercial Bank Restructuring Project (CBRP), and automation, were implemented one after the other to meet the demands of the times.

3.2.4.1 Nationalization (1972):

All commercial banks that operated in Bangladesh and were owned by citizens of Bangladesh and Pakistan were reorganized into six nationalized banks—Sonali, Agrani, Janata, Rupali, Pubali, and Uttara Bank—under the Bangladesh Bank Nationalization Order of 1972. Additionally, the international banks were excluded from the nationalization process. It should be noted that shortly after independence, nationalization became necessary in order for the government to seize control of the businesses that the non-Bengalis had left behind.

Second, it was politically expedient for the recently elected Bangladeshi government to fulfill its pledge to nationalize all banks and financial institutions, including the industries. Following nationalization, the banks were subject to stringent government oversight and central bank rules. These included setting deposit and lending rates, giving precedence to certain industries for lending, and growing the number of bank branches, especially in rural areas where there was a lack of banking.

The nationalization program's overarching goal was to guarantee social justice and equity, as well as an equitable distribution of income, economic power, and opportunities. However, thereafter, the remarkable accomplishment in the banking industry came to an end for a number of reasons. The entire financial system was monopolized by foolish and incorrect policies.

According to government orders, banks and other financial institutions followed a program of excessive credit growth to priority sectors between 1972 and 1982, completely disregarding the quality of the loans. Due to socioeconomic factors, a safe and healthy credit policy was abandoned. Regardless of feasibility considerations, a large number of rural branches were opened.

The rates for lending to the priority sector were kept so low that they even failed to pay the costs of other factors and risk. Large sums of bank loans were consequently delayed. Unmanageable amounts of bad debt accumulated, and the loan recovery effort was appallingly inadequate. Finally, the government was forced to make a "U-turn" and implement the denationalization, deregulation, and privatization policies.

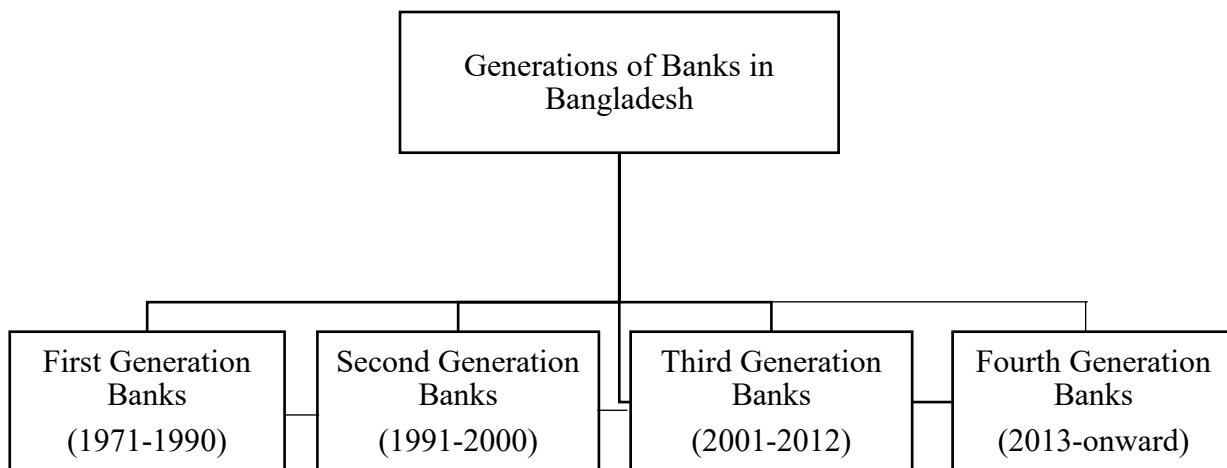
3.2.4.2 Denationalization and Privatization (1982-83):

The denationalization and privatization process included two sorts of reforms: the handover of government-owned assets to the private sector and the fostering of competition between NCBs and newly founded commercial banks. In Bangladesh, the first private sector bank was founded in 1982, and National Bank Limited took over as the new institution in 1983. The year 1983 saw the establishment of five new commercial banks, signaling the start of a gradual increase in the number of financial institutions.

In 1983, two NCBs—Uttara and Pubali Bank—were also denationalized and given private control. Then, four new banks entered the group of private sector banks: IFIC (International Finance, Investment and Commerce Bank Limited), Islami Bank Bangladesh Limited, City Bank Limited, and UCBL (United Commercial Bank Limited). The banking industry is currently transitioning out of a period of intense rivalry as more and more private banks are opened. Many even contend that the nation already has more banks than it needs. The bank and its executives are still striving for Bangladesh's economy to be stable in spite of this incident.

3.3 Different Generations of Banks in Bangladesh:

Bangladesh's banking industry is constantly expanding as more banks open their doors on a regular basis. Four generations of banks have been established in Bangladesh, taking into account the year of formation.



Source-Google

2.4 First Generation Banks (1971-1990)

First-generation banks are those that obtained their licenses and began operations between 1971 and 1990.

SL No:	Bank Name	Establishment Year
01.	Agrani Bank Limited	Habib Bank Limited and Commerce Bank Limited were renamed as Agrani Bank Limited under President's Order No. 26 of 1972. 17 May 2007 incorporated as a State-owned Commercial Bank.
02.	Sonali Bank Limited	National Bank of Pakistan, Bank of Bahawalpur and Premier Bank were renamed as Sonali Bank under President's Order No. 26 of 1972. 15 June 2007 started banking activities as named Sonali Bank Limited.
03.	Rupali Bank Limited	Muslim Commercial Bank Ltd., Australasia Bank Ltd. and Standard Bank Ltd. were renamed Rupali Bank Limited under President's Order No. 26 of 1972. 14 December 1986 emerged as the largest Public Limited Banking Company of the country
04.	BASIC Bank Limited	02 August 1988
05.	Janata Bank Limited	United Bank Limited and Union Bank Limited were renamed Rupali Bank Limited under President's Order No. 26 of 1972. On 15 November 2007 restructured it as a public limited company.
06.	Bangladesh Krishi Bank	1973
07.	Rajshahi Krishi Unnayan Bank	Established in 1986. Start Operation-15 March, 1987
08.	Pubali Bank Limited	Started in the name Eastern Mercantile Bank Limited in 1959 and was denationalized in 1983.
09.	IFIC Bank Limited	1976
10.	National Bank Limited	28 March 1983
11.	National Credit and Commerce Bank Limited	1985
12.	The City Bank Ltd.	1983
13.	United Commercial Bank Limited	1983

14.	Uttara Bank Limited	Started on 28th January of 1965 in name of “Eastern Banking Corporation” and was privatized in June, 1983.
15.	Islami Bank Bangladesh Limited	13 March 1983
16.	ICB Islamic Bank Limited	April 1987
17.	Standard Chartered Bank	First branch in Bangladesh in 1948 in Chattogram. (Established in 1905)
18.	State Bank of India	5th May 1975 starts its operation in independent Bangladesh. (Founded in 1806)
19.	The Hong Kong and Shanghai Banking Corporation. Ltd.	First branch in Bangladesh in 1996.(Established in China in March 1865.)
20.	National Bank of Pakistan	1949
21.	Woori Bank	21 September 1996 this Korean bank commenced its operation.
22.	City Bank NA	1987. (Established on June 16, 1812 in New York)
23.	AB Bank Limited	AB Bank Limited was incorporated on 31st December, 1981 in Bangladesh. (Established in 1946)
24.	Habib Bank Limited	August 25, 1940, First branch in Bangladesh in 1976.

Source: Google

2.5 Second Generation Banks (1991-2000):

Banks that were established between 1991 and 2000 are referred to as second-generation banks.

SL No:	Bank Name	Establishment Year
01.	Bangladesh Commerce Bank Limited	1 June 1998.
02.	Bank Asia Limited	1999
03.	Dhaka Bank Limited	05 July 1995
04.	Eastern Bank Limited	1992
05.	Export Import Bank of Bangladesh Limited	1999
06.	Mercantile Bank Limited	02 June, 1999
07.	Mutual Trust Bank Limited	29 September 1999
08.	ONE Bank Limited	May 1999
09.	The Premier Bank Limited	10 June 1999
10.	Southeast Bank Limited	1995
11.	Trust Bank Limited	1999
12.	Prime Bank Limited	1995
13.	Social Islami Bank Ltd.	1995
14.	First Security Islami Bank Limited	29 August 1999
15.	Bank Al-Falah Limited	01 November 1997 (In 1947 commenced in Pakistan)

16.	Al-Arafah Islami Bank Limited	18 June 1995
17.	Standard Bank Limited	11 May 1999

Source: Google

2.6 Third Generation Banks (2001-2012):

Banks who get licenses from 2001-2012 are called third-generation banks.

SL No:	Bank Name	Establishment Year
01.	BRAC Bank Limited	2001
02.	Dutch-Bangla Bank Limited	2002
03.	Jamuna Bank Limited	03 June 2001
04.	Probashi Kollyan Bank	20 April 2011
05.	Shahjalal Islami Bank Limited	10 May 2001
06.	Commercial Bank of Ceylon Limited	In 2003 it started journey in Bangladesh. (Established in Sri Lanka in 1920)
07.	Bangladesh Development Bank Ltd.	16 November, 2009 (BDBL is the amalgamation of former Bangladesh Shilpa Bank (BSB) and Bangladesh Shilpa Rin Sangstha (BSRS),

Source: Google

2.7 Fourth Generation Banks (2013- onwards)

All banks who are getting licenses from 2013 till now are called fourth generation banks.

SL No:	Bank Name	Establishment Year
01.	Bengal Commercial Bank Limited	23 February 2020.
02.	Community Bank Bangladesh Limited	2019
03.	Meghna Bank Limited	09 May 2013
04.	Midland Bank Limited	20 March 2013
05.	Modhumoti Bank Ltd.	2013
06.	NRB Bank Limited	04 August, 2013
07.	NRB Commercial Bank Limited	02 April 2013
08.	Padma Bank Limited	29 January 2019
09.	Probashi Kollyan Bank	20 April 2011
10.	Shimanto Bank Limited	Licensed on 21 July 2016. Inaugurate the bank on September 1, 2016.

11.	South Bangla Agriculture & Commerce Bank Limited	2013
12.	Union Bank Limited	2013
13.	Global Islami Bank Limited	25 July 2013

Source: Google

Chapter- 04

Methodology

In this study we used panel data covering 20 conventional banks out of 34 for the period of 2009 to 2018 with 10 years' data for each bank. Five hypotheses have been developed indicating the directions about whether the independent variables under capital adequacy and asset quality are positively or negatively related to profitability. Return on Equity (ROE), Return on Assets (ROA), and Net Interest Margin (NIM) are the metrics we used to quantify profitability. Under the components capital adequacy and asset quality, the study's independent variables are the following: CAR, Equity to Assets, Bank Size, NPL to Total Loan, and Loan Loss provision to Total Asset. Three distinct models will be used to demonstrate the effects of the five explanatory factors, one after the other, on the three dependent variables (ROA, ROE, and NIM). To find out the outcome, we have applied different approaches such as factor analysis, regression analysis along with model summary, analysis of variance and coefficient analysis, correlation analysis, trend analysis. To do these analyses, we have used SPSS and Excel.

Return on Equity (ROE), Return on Assets (ROA), and Net Interest Margin (NIM) are the metrics used to quantify profitability. Here, the effects of asset quality and capital sufficiency on the profitability of Bangladesh's traditional banks are being noted. This chapter aims to set up the foundation of data analysis for the study.

4.1 Variables

$$Y (Y1, Y2, Y3) = \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \beta_5 X5 + \epsilon$$

Y represent profitability which is defined in terms of Return on Asset (ROA), Return on Equity (ROE) and Net Interest Margin (NIM).

Y1, Y2, Y3 represents Return on Asset, Return on Equity and Net Interest Margin respectively.

X1 represent Capital Adequacy Ratio

X2 represent Equity to Asset Ratio

X3 represent Bank Size

X4 represent Non-Performing Loan to Total Loan Ratio

X5 represent Loan Loss Provision to Total Asset Ratio

The independent variables under Capital Adequacy and Asset Quality and dependent variables including ROA, ROE and NIM along with their formulas are summarized in Table 4.1.

Table 4.1: Definition of Variables (dependent & independent) along with their formulas

<u>Variable</u>	<u>Definition</u>	<u>Formula</u>
Return on Assets (ROA)	It indicates the efficiency of a company's management at generating earnings through the efficient use of assets.	Net income/ Average total assets
Return on Equity (ROE)	It indicates the ability of a company to generate profits from its shareholders' investment in that firm.	Net income / Shareholders Equity
Net Interest Margin (NIM)	Net Interest Margin measures the efficiency of a firm in investing its funds in comparison to the expenses associated with that investment.	(Investment Income Interest Expenses) / Average Earning Assets
Equity to Assets	It indicates the amount of equity that the business firm has compared to the total asset of that firm or bank.	Total Equity / Total Assets
Bank size	It is considered in terms of total asset.	Natural log of the total asset
Non-Performing Loans to Total Loans Ratio	It indicates the amount of nonperforming loans in a bank's loan portfolio to the total amount of outstanding loans.	Total Non-Performing Loan / Total loans
Loan Loss Provision to Total Assets Ratio	It is used to cover the potential loan losses	Loan Loss Provision / Total Asset
Capital Adequacy Ratio (CAR)	CAR is considered as a safeguard against the adverse situation. Tier-1 capital is the primary funding source of the bank. It consists of shareholders' equity and retained earnings. Tier-2 capital includes revaluation reserves, hybrid capital instruments and subordinated term debt, general loan-loss reserves, and undisclosed reserves. Tier 2 capital is used to sustain a loss if there's liquidation.	CAR= (Tier 1 capital+ Tier 2 Capital) / Risk Weighted Asset

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Source-Google

4.2 Hypothesis

Tests of the following hypothesis:

H1: Capital adequacy ratio and profitability are positively related.

H2: Positive relationship exists between profitability and Equity to Asset ratio.

H3: Impact of bank size on profitability is positive.

H4: Negative relationship exists between non-performing loan to total loan ratio and profitability.

H5: Loan loss provision to total asset ratio and profitability are negatively related.

4.3 Data Collection

Informations of this study have been collected from the secondary sources. No primary source was used. Secondary sources include the following:

- Financial statements of the selected twenty (20) conventional banks.
- Manuals/booklets of the Bangladesh Banks.
- Research papers, journal articles on this area published on the website.

4.4 Research Design

The caption of this study is –Capital Adequacy, Asset Quality, and Bank’s Profitability: A

Study on Conventional Banks in Bangladesh”. The impact of capital requirements according to Basel accords adopted in Bangladesh by the Bangladesh Bank along with asset quality on the profitability of conventional banks will be analyzed in this study.

We used Panel data for this study covering twenty (20) conventional banks out of 34 conventional banks of Bangladesh from period 2009 - 2018 with data of ten (10) years for each bank. Due to lack of data availability the fourth-generation banks are being excluded in this study.

4.5 Econometric Methods

Return on Equity, Return on Asset, and Net Interest Margin are the three metrics used to determine profitability. Our dependent variable is profitability, and the independent variables under the components of capital adequacy and asset quality are the loan loss provision to total asset, equity to assets, bank size, and CAR. While analyzing the data through regression model, we will see here three models for three types of profitability indicators in the data analysis part.

Tools:

- Microsoft Excel Sheet- Excel sheet has been used for sorting and finding out raw data and for the graphs shown in the Trend Analysis.
- Microsoft Word- this has been used to present the contents of the whole study.

Techniques:

- **Factor Analysis:** In this analysis, we shall perform the KMO and Bartlett's sphericity test along with the extraction of best components from the 5 independent variables based on eigenvalues.
- **Descriptive statistics:** It is the summary statistics where mean, minimum, maximum and standard deviation of each variable will be analyzed.
- **Regression analysis:** In the regression analysis we shall analyze the data based on three indicators – 1) model summary, 2) ANOVA table and 3) Coefficients analysis. There will be three regression analysis for the dependent variables (ROA, ROE, and NIM).
- **Summary findings:** In the methodology, we have developed 5 hypotheses indicating the directions about whether the independent variables under capital adequacy and asset quality are positively or negatively related to the profitability. In the summary findings based on the 3 coefficient tables under 3 regression models, we shall compare our estimated hypothesis with our empirical results through three summary findings for three regression models.
- **Correlation analysis:** It will be done from the perspectives of three forms of profitability. Along with the analysis of the correlation between independent and dependent variables we

shall also give an interpretation for the correlation among independent variables to check the problem of multi-co-linearity.

- **Trend analysis:** Trend analysis will be used to assess the performance conditions of the conventional banks based on the data of the 20 selected conventional banks.

This chapter says all about the methodology part that is being used from the beginning to the end of the study. In this chapter, introduction, description of the variable, hypothesis, data collection, research design, tools and techniques for data analysis and model specifications are being discussed.

Chapter- 05

Data Analysis and Discussions

By doing some data analysis the impact of capital adequacy and asset quality on profitability can be evaluated. Based on our literature review we can say that both capital adequacy and asset quality have impact on profitability. We have selected five variables as independent variables and different types of tests and analysis on the collected data have been conducted in this chapter.

5.1 Factor Analysis

Factor analysis is a data reduction process. A factor analysis can be carried out using a variety of techniques, such as the primary axis factor, generalized least squares, and unweighted least squares. We have used principal axis factor method in our study.

The factor analysis method requires a large sample size. The basis of this factor analysis method is the correlation matrix. Correlation typically requires a high sample size for stabilization.

The following table includes the opinion sample size as stated by Comrey and Lee (1992).

Table 5.1 Required Sample Size for factor analysis

Sample Size	Ranking
50	Very poor
100	Poor
200	Fair

300	Good
500	Very good
1000 or more	Excellent
As a rule of thumb, a bare minimum of 10 observations per variable is necessary to avoid computational difficulties.	

Source: Comrey and Lee's (1992)

In our study, data of ten years for each 20 conventional banks are taken. So, our sample size is of 200 observations.

In our study we have used factor analysis to simplify data in regression models. Through factor analysis what we want to see here is that whether our five selected independent variables are adequate for conducting the research and also to find out the best components. For factor analysis KMO and Bartlett's test needs to be done to measure the sampling adequacy.

5.1.1 Kaiser- Meyer- Olkin and Bartlett's test of sampling adequacy

In table 5.2 Kaiser- Meyer- Olkin and Bartlett's test have been done to check the sampling adequacy of this research. The benchmark here in this test is (0.50). The sampling adequacy is said to be satisfactory when KMO test result is .50 or more than .50. When sampling adequacy is less than .50 it indicates that the factor analysis is not useful. In our analysis it is (0.503), so factor analysis is useful here and our taken sample is adequate.

The correlation matrix and identity matrix differ significantly, as shown by Bartlett's test of sphericity. An identity matrix is a square matrix with all of the remaining members being 0s and all of the primary diagonal elements being 1s. There are n*n examples of identity matrices: 1*1, 2*2, and 3*3. According to Bartlett's Test of Sphericity, a correlation matrix is an identity matrix that shows variables are unrelated and so inappropriate for structure discovery.

Table 5.2 KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.503
Bartlett's Test of Sphericity	Approx. Chi-Square	61.795
	Df	10
	Sig.	.000

Source: Author's Estimation

Table 5.2 shows that the KMO test result is .503, which is higher than .50. This suggests that the sampling adequacy meets the required standards. When using Bartlett's test, the correlation matrix is not an identity matrix and the significance value is $.000 < .05$, indicating that the null hypothesis is rejected. Therefore, the variables make sense for structure detection and are connected.

5.1.2 Communalities and Eigen values

Table 5.3: Communalities in the factor analysis

Communalities		
	Initial	Extraction
CAR	1.000	.507
NPL to Total Loan	1.000	.681
Loan Loss Provision to Total Asset	1.000	.781
Bank SIZE	1.000	.692
Equity to Assets	1.000	.993

Source: Author's Estimation

The percentage of each variable variance that the primary components can explain is referred to as a community. In the main component analysis, the communality's initial value is 1, by definition. The percentage of each variable's variance that the principal component can account for is indicated by the values in the extraction column. High-valued variables are well-represented. We do not have any particular low value in our study.

Table 5.4: Extracting components through Eigen values

Extraction Method: Principal Component Analysis.						
Total Variance Explained						
Component	Initial Eigen values			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %

1	1.581	31.622	31.622	1.581	31.622	31.622
2	1.073	21.451	53.073	1.073	21.451	53.073
3	1.000	20.010	73.083	1.000	20.010	73.083
4	.823	16.457	89.540			
5	.523	10.460	100.000			
Extraction Method: Principal Component Analysis. ^a						
a. 3 components extracted.						

Source: Author's Estimation

We have used five independent variables in this research, so we have five components in this research. Eigen values are the variance of the principal components. Factor with an Eigen value greater than or equal to 1 explains more variance. Components 1, 2 and 3 (CAR, NPL to Total Loan and Loan Loss Provision to Total Assets) are identified as the best components as they have an Eigen value greater than 1 according to calculation through SPSS. These three best components together account for 73.08% variance shown in the third column of cumulative variance.

Through factor analysis what we want to see here is that whether our selected five variables are adequate for conducting the research or not.

5.2 Descriptive Statistics

Table 5.5: Descriptive analysis for all the dependent and independent variables

Variable	Year observations	Minimum	Maximum	Mean	Std. Dev.
Return on assets	200	.00010	.04010	.0131720	.00687140
Return on equity	200	.00130	.73130	.1490195	.08040911
Net interest margin	200	.00780	.07450	.0359065	.01094128
Capital Adequacy Ratio	200	.06310	.17040	.1196538	.01524620
Equity to Assets Ratio	200	.00710	1.20640	.0921394	.09462244
Bank Size	200	8.83438	12.92331	11.8485447	.71316916
Non-performing loan to total loan	200	.01179	.33073	.0476570	.02923545
Loan loss provision to total assets	200	.00130	.04100	.0115178	.00643408

Source: Author's Estimation

Table 5.4 displays the observed variables' summary statistics. For the twenty conventional

banks, the average return on equity is 14.90% and the average return on assets is 1.32%. In terms of NIM, the average figure for the conventional banks covered by this study is 3.59%. The average capital adequacy ratio is 11.97%, which is greater than the BASEL III's benchmark requirement of 10%. 9.21% is the average equity to asset ratio. Here, the average value of the bank size is 11.85. Conventional banks in Bangladesh have an average NPL to Total Loan ratio of 4.77% and a Loan Loss Provision to Total Asset of 1.15%.

5.3 Regression Model (Here, defining profitability in terms of ROA)

Three factors have been used in this study to determine the dependent variable, or bank profitability: net interest margin, return on equity, and return on assets. Three distinct models will be used to demonstrate the effects of these five independent factors on the three dependent variables (ROA, ROE, and NIM). This provides the ROA linear regression model.

$$Y (ROA) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$$

5.4 Regression Analysis

In the regression analysis, we will see the model summary, analysis of variance and coefficient analysis.

5.4.1 Model summary

Table 5.6: Model summary of the regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.539	.291	.273	.00586040

Source: Author's Estimation

The multiple R indicates a correlation between the observed and predicted values. For instance, there is a positive association between the independent and dependent variables if the R value is equal to 1. There is no correlation between the observed and anticipated values if the R value is zero. A somewhat positive correlation of .539 is shown here between the independent and dependent variables. Another name for the coefficient of determination is R square. It calculates the proportion of a dependent variable's variance that the independent factors account for. A low effect size is one where the R square value is larger than .3 but less than .5. There is a very weak effect size if the R square value is less than .30. An effect size is deemed strong if the R square value is higher than .70. Adjusted R square is the percentage of variation that can be explained by those independent factors that have an impact on the dependent variable. In this case, the Adjusted R Square value is 27.3%, meaning that 27.3% of the independent factors can adequately explain ROA. The average separation between the observed

values and the regression line is shown by the standard error of the estimate. A smaller standard error is implied when the observations are closer to the fitted line. The typical mistake in this case is .0058, which is closer to the regression line and indicates a very tiny error.

5.7.2 ANOVA

Table 5.7: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.003	5	.001	15.917	.000 ^b
	Residual	.007	194	.000		
	Total	.009	199			

Source: Author's Estimation

To determine whether the independent variables have a mutually significant effect on the dependent variable (in this case, ROA), utilize the ANOVA table. In the ANOVA table, the F value and P-value are contrasted. The independent factors together appear to have a considerable influence on the dependent variables if the F value is larger than the p value, or if the p value is just less than .05. The ANOVA table displays a F value of 15.917 and a p value of .000, indicating that the F value is bigger than the p value. P values below .05, or .000, similarly indicate a strong significant value. Thus, it is evident that there is a highly significant linear relationship between the dependent variable ROA and the five independent factors.

5.7.3 Coefficient Analysis

Table 5.8: Coefficient Analysis (Dependent Variable= Return on Assets)

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.047	.007		6.341	.000
	CAR	-.021	.028	-.047	-.744	.458
	Equity to Assets	.010	.004	.139	2.304	.022
	Bank Size	-.002	.001	-.227	-3.539	.001
	NPL to Total Loan	-.060	.016	-.253	-3.703	.000
	Loan Loss	-.268	.071	-.251	-3.756	.000

Source: Author's Estimation

Based on the above table the actual regression equation for this model is:

$$\text{ROA} = .047 - .047*\text{CAR} + .139*\text{Equity to assets} - .227*\text{Bank size} - .253*\text{NPL to total loan} - .251*\text{Loan loss provision to total asset}$$

When all the explanatory variables are zero the intercept is .047 which refers to the value of ROA. Except for the Capital adequacy ratio all the coefficients are statistically significant in this model. Here, when the p-value is less than .05 we consider a relationship as significant.

For one-unit change in Capital adequacy ratio, bank size, NPL to total loan and loan loss provision to total assets ROA will decrease by respected amounts (amount of beta in the above table) as these are associated with negative coefficients. Except for the equity to asset ratio, all the explanatory variables show that there is a negative impact on the ROA.

The profitability of conventional banks has a significant positive relationship with Equity to Assets ratio. When equity increases a bank becomes more stable. More funds to invest. Therefore, ROA will be increased.

5.7.4 Summary findings on key variables

Based on our expected results, we indicated whether the coefficients associated with variables are positive or negative in those hypotheses. After running the regression analysis, we will compare our empirical results with our expected results in the following table 5.8 where profitability is defined in terms of ROA.

Table 5.9: Expected sign Vs. Empirical sign

Variables	Expected sign with ROA	Empirical sign with ROA
CAR	+	-
Equity to Assets	+	+
Bank Size	+	-
NPL to Total Loan	-	-
Loan Loss Provision to Total Asset	-	-

Source: Author's Estimation

Although in the hypothesis CAR and bank size shows a positive sign, they are negatively related with profitability of conventional banks in Bangladesh. Capital adequacy decreases profitability mainly for two reasons:

1) To meet up the minimum capital requirements banks do short term borrowing which increases the cost and decreases profitability of the conventional banks.

2) For the high liquidity holding banks imposing higher capital will work as a penalty as well as decrease the profitability of those banks.

Bank size has a negative impact on profitability. Banks that are bigger in size cannot attain the economies of scale. As a result, they cannot achieve the lowest cost possible. Other variables have shown the expected results.

5.5 Correlation Analysis (Here, profitability is defined in terms of ROA)

Table 5.10: Correlation matrix

	Y-Return on Assets	X1-Capital adequacy ratio	X2-Equity to Assets	X3-Bank size	X4-NPL to total loan	X5-Loan loss provision to total assets
Y-Return on Assets	1					
X1-Capital adequacy ratio	-.162* (.022)	1				
X2-Equity to Assets	.147* .038	.003 .968	1			
X3-Bank size	-.299** (.000)	.219** (.002)	-.018 .798	1		
X4-NPL to total loan	-.416** (.000)	.138 (.052)	-.015 .837	.238** (.001)	1	
X5-Loan loss provision to total assets	-.357** (.000)	.125 (.079)	.000 .995	-.003 (.966)	.401** (.000)	1

Source: Author's Estimation

P values are enclosed in parenthesis, and values denoted by * and ** signify significance at the 5% and 10% levels, respectively. Table 5.10 displays the Pearson correlation coefficient for the variable return on assets as the dependent and the five independent variables capital adequacy ratio, equity to assets, bank size, NPL to total loan, and loan loss provision to total asset. Here, the variables are linearly related and have a normal distribution. The degree to which two or more variables have a linear relationship is measured by correlation.

There is a significant moderate negative correlation between NPL to total loan and conventional bank's profitability. When NPL increases, banks' return from loan decreases. Therefore, ROA asset decreases due to less income.

There is a weak but significant negative correlation between the bank's profitability and its size, the capital adequacy ratio, and the loan loss provision to total assets. Only ROA and the equity to asset ratio have a favorable correlation.

5.6 Regression model (Here, profitability is defined in terms of ROE)

$$Y (ROE) = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon$$

5.7 Regression Analysis (for the dependent variable ROE)

Regression Analysis for the dependent variable ROE with five independent variables will be analyzed through model summary, ANOVA table, and coefficient table.

5.8.1 Model Summary

Table 5.11: Model summary of the regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.434	.188	.167	.07338604

Source: Author's Estimation

The independent and dependent variables have a positive correlation in this case, as indicated by R=.434. When a model's independent variables account for 18.8% of the observed variation, the R square value is equal to.188. This has a somewhat lower R square value. With an adjusted R Square value of 16.7%, 16.7% of the independent variables can account for the ROE. The observed values are closer to the regression line in this case, as indicated by the standard error of.0733, or 7.33, which is a very tiny error.

5.8.2 ANOVA

Table 5.12 ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.242	5	.048	8.982	.000 ^b
	Residual	1.045	194	.005		

	Total	1.287	199			
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Source: Author's Estimation

This ANOVA table indicates that the value of F is bigger than the p value, with F= 8.982 and p-value =.000. Thus, we can draw the conclusion that there is a highly significant linear relationship between the dependent variable, ROE, and the five independent factors. The significance level in this case, which is.000, suggests that the combined effect of all the independent factors on the bank's profitability is substantial.

5.8.3 Coefficient Analysis

In the coefficient analysis, we shall consider the standardized coefficient.

Table 5.13: Coefficient Analysis

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.519	.092		5.653	.000
	CAR	-.363	.353	-.069	-1.027	.306
	Equity to Assets	.033	.055	.039	.599	.550
	Bank Size	-.023	.008	-.206	-3.008	.003
	NPL to Total Loan	-.387	.201	-.141	-1.920	.056
	Loan Loss Provision to Total Asset	-3.159	.893	-.253	-3.538	.001

Source: Author's Estimation

The actual regression equation for this model based on the above table is:

$$\text{ROE} = .519 - .069 \cdot \text{CAR} + .039 \cdot \text{Equity to Assets} - .206 \cdot \text{Bank size} - .141 \cdot \text{NPL to total loan} - .253 \cdot \text{Loan loss provision to total asset}$$

Even if all the other independent variables are 0 the intercept is .519 which means that ROE will be .519. This constant or intercept is simply that value at which the y-axis crosses the fitted line. Coefficients of Bank size and loan loss provision to total assets are statistically significant in this model. Bank's profitability is significantly negatively correlated with loan loss provision to total asset

and bank size. For one-unit change in bank size and loan loss provision to total asset ROE will decrease by .206 and .253 respectively.

Similarly, for one-unit change in CAR and NPL to total loan, profitability will decrease by .069 and .141. Profitability is positively related to equity to asset. For one-unit change in equity to asset ROE will increase by .039. The coefficients of CAR, equity to asset and NPL to total loan are not statistically significant as p-value is more than .05.

5.8.4 Summary findings on variables

Table 5.14: Expected Vs Empirical signs of coefficients

Variables	Expected sign with ROE	Empirical sign with ROE
CAR	+	-
Equity to Assets	+	+
Bank Size	+	-
NPL to Total Loan	-	-
Loan Loss Provision to Total Asset	-	-

Source: Author's Estimation

Empirical results of equity to asset, NPL to total loan and loan loss provision to total assets are similar to the expected results.

5.8 Correlation Analysis (Here, profitability is defined in terms of ROE)

Table 5.15: Correlation Analysis when the dependent variable is ROE

	Y-Return on Equity	X1-Capital adequacy ratio	X2-Equity to Assets	X3-Bank size	X4-NPL to total loan	X5-Loan loss Provision to total assets
Y-Return on Assets	1					
X1-Capital adequacy	-.165*	1				

ratio	(.020)					
X2-Equity to Assets	.044 .534	.003 .968	1			
X3-Bank size	-.255** (.000)	.219** (.002)	-.018 .798	1		
X4-NPL to total loan	-.301** (.000)	.138 (.052)	-.015 .837	.238** (.001)	1	
X5-Loan loss provision to total asset	-.317** (.000)	.125 (.079)	.000 .995	-.003 (.966)	.401** (.000)	1

Source: Authors estimation

The profitability of banks is significantly correlated negatively with (capital adequacy ratio, bank size, NPL to total loan, and loan loss provision to total asset).

Banks are required to maintain a minimum level of CAR which is 10% under BASEL III. As there is an increasing trend on the level of NPL, banks are required to maintain other reserves to face any unexpected events. So, for banks protection more capital is required which will reduce the amount of loan disbursement. Along with a decrease in loan disbursement, return from earning assets also decreases. Therefore, ROE also decrease.

For other independent variables correlation from the regression analysis we have found that, all the values are less than .80; which means that there is no multi-co linearity problem.

5.9 Regression Model (Defining profitability in terms of NIM)

$$Y (NIM) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$$

5.10 Regression Analysis

Regression Analysis for the dependent variable NIM with five independent variables are shown below:

5.11.1 Model Summary

Table 5.16: Model summary of the regression analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.236 ^a	.056	.031	.01076780	1.613

Source: Author's Estimation

A positive correlation between the independent and dependent variables is indicated by the table's $R=.236$. $R^2=.056$ indicates that the independent variables in the model account for 8.7% of the observed variation. The modified R^2 value is 3.1%. One of the main drawbacks of R^2 is that it is unable to determine whether a regression model is sufficient or not. A good model can have a low R^2 value, and a model that does not fit the data can have a high R^2 value. A P-value of less than .05 indicates that a model has statistically significant explanatory power. Small sample sizes can occasionally result in high R^2 . R^2 adjustment may be zero. The modest error of the standard error, which is equal to .01076 or 1.07%, shows that the observed values are closer to the regression line.

5.11.2 ANOVA

Table 5.17: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.001	5	.000	2.293	.047 ^b
	Residual	.022	194	.000		
	Total	.024	199			

Source: Author's Estimation

In this ANOVA table $F=2.293$ and $p\text{-value} = .000$. F value is greater than p-value. As P-value is less than .05 which is .000 it implies that the significant value is high. So, we can conclude that a high significant linear relationship exists between the independent variables and the dependent variable NIM.

5.11.3 Coefficient Analysis

Table 5.18: Coefficient analysis

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.010	.013		.717	.474
	CAR	.058	.052	.081	1.127	.261
	Equity to Assets	.007	.008	.058	.833	.406
	Bank Size	.002	.001	.126	1.706	.090
	NPL to Total Loan	-.059	.030	-.159	-2.010	.046

	Loan Loss Provision to Total Asset	-.125	.131	-.073	-.952	.342
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Source: Author's Estimation

Based on the above table the actual regression equation for this model is:

$$\text{NIM} = .010 + .081 \cdot \text{CAR} + .058 \cdot \text{Equity to assets} + .126 \cdot \text{Bank size} - .159 \cdot \text{NPL to total loan} - .073 \cdot \text{Loan loss provision to total asset}.$$

CAR, equity to assets, bank size has a positive relationship with NIM. For one-unit change in CAR, equity to assets and bank size NIM will increase by .081, .058 and .126.

In case of CAR, banks are able to control their costs which increase the positive gap between the earnings and costs of funds, which ultimately increases NIM. So, in case of NIM, CAR and bank's profitability has a positive impact. Conversely, there is a negative correlation between NIM and loan loss provision relative to total asset. The connections between CAR, equity to assets, bank size, and loan loss provision to total asset with NIM are not significant in this case, with the exception of NPL to total loan.

5.11.4 Summary findings on key variables

Table 5.19: Expected Vs Empirical results

Variables	Expected sign with NIM	Empirical sign with NIM
CAR	+	+
Equity to Assets	+	+
Bank Size	+	+
NPL to Total Loan	-	-
Loan Loss Provision to Total Asset	-	-

Source: Author's Estimation

All of the empirical findings in the instance of NIM precisely match the predictions. While NPL to total loan and loan loss provision to total asset have a negative association with NIM, equity to asset and NIM have a positive link.

5.11 Correlation analysis (profitability defined in terms of NIM)

Table 5.20: Correlation

	Y-Return on Equity	X1-Capital adequacy	X2-Equity to Assets	X3-Bank size	X4-NPL to total loan	X5-Loan loss provision to
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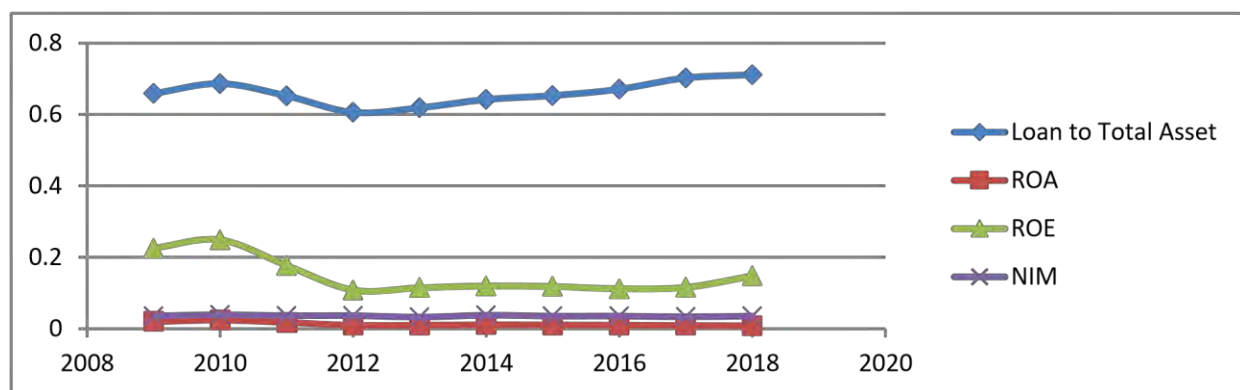
		ratio				total assets
Y- Return on Assets	1					
X1-Capital adequacy ratio)	.078 (.271)	1				
X2-Equity to Assets	.058 (.412)	.003 .968	1			
X3- Bank size	.105 (.138)	.219** (.002)	-.018 .798	1		
X4-NPL to total loan	-.148* (.037)	.138 (.052)	-.015 .837	.238** (.001)	1	
X5-Loan loss provision to total assets	-.127 (.073)	.125 (.079)	.000 .995	-.003 (.966)	.401** (.000)	1

Source: Author's Estimation

There is no multi-collinearity problem in the correlation analysis as the relationships among the independent variables are less than .80. CAR, equity to asset and bank size are positively related to NIM.

5.12 Trend Analysis

Graph 5.1: Loan to total asset ratio with profitability

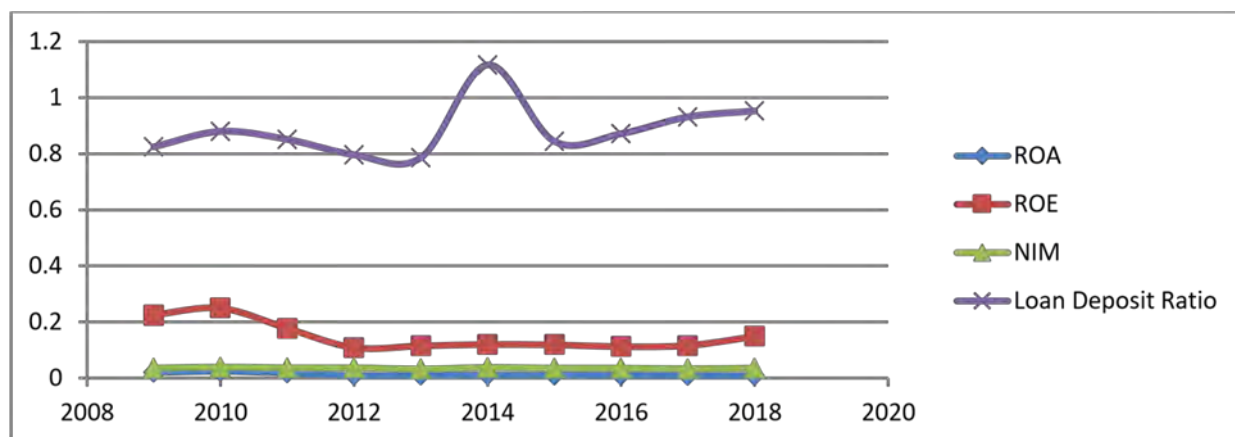


Source: Bangladesh Bank

The bank's loan portfolio in relation to total assets is reflected in the loan to total asset ratio. A greater ratio indicates a higher risk for banks because loans are less liquid assets. The loan to total asset ratio demonstrates that return on equity and return on assets are positively correlated. As the amount of loans increases, net revenue rises through interest income. ROE and ROA both rise with

net income. The relationship is somewhat negative in the case of the net interest margin. This is due to the fact that NIM falls if costs, including deposits and fund costs, rise relative to interest revenue from loans.

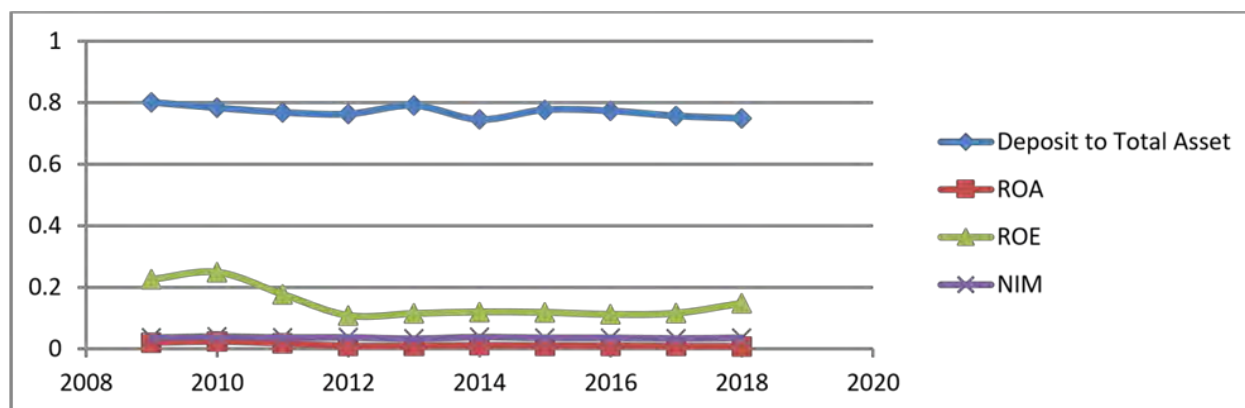
Graph 5.2: Loan to deposit ratio and profitability



Source: Bangladesh Bank

Net interest margin is positively related to loan to deposit ratio. An increase in interest income from loan increases NIM. Loan to deposit ratio is negatively related to ROE and ROA. This means that when loan increases compared to deposits the company cannot find out enough deposits to lend. It in turn decreases the net profit, which ultimately decreases ROA and ROE.

Graph 5.3: Deposit to total asset and profitability



Source: Bangladesh Bank

Deposit to total asset and net interest margin is positively related to each other. Here the conventional banks of Bangladesh are able to reduce the cost of deposits, which increases NIM. Deposit to total asset is negatively related to ROA and ROE. When the volume of deposit increase although at a lower cost compared to interest income, the total cost of deposit put a negative impact on net income. As a result, ROA and ROE are negatively related with a deposit to total asset ratio.

Different types of tests have been done to get an evidence of the impact of capital adequacy and asset quality on profitability. The summary of the data analysis is shown in the next chapter “Findings”.

Chapter - 06

Findings

Some major findings have been extracted based on the analysis part. This part will summarize the whole report's findings.

6.1 Major Findings

This study's main goal is to examine how capital adequacy and asset quality affect conventional banks in Bangladesh's profitability (as measured by ROA, ROE, and NIM). It also seeks to determine whether changes in these variables significantly boost or diminish profitability. There are also some other objectives. By conducting the whole research, our findings are described as follow:

- The sampling size is adequate as the KMO test's result is .503 which is equal to the standard.50. The matrix is not an identity matrix. Factor analysis was used to reduce the number of variables in regression models and simplify the data.

- We have found out that three out of five independent variables have been extracted as the best components having an eigenvalue higher than 1. This is the first step to fulfill our objective. It verifies the adequacy of our sample size which is used to find out the impact on profitability by capital adequacy and asset quality.
- Bank size, loan loss provision to total asset, NPL to total loan, and capital adequacy ratio all have an adverse effect on return on assets (ROA). ROA declines as profitability rises. Regarding whether CAR has a positive or negative effect on profitability, there has been some debate in the literature review section. The relationship between equity to asset and profitability is positive, indicating that soundness and safety are ensured when core capital through equity increases. Profitability also increases as well. As NPL to total loan and profitability is negatively related, this means that in order to achieve more profitability banks need to lower the NPL. For conventional banks in Bangladesh, we have found that bank size hurts profitability as bank size works as diseconomies of scale. So banks need to thrive towards achieving economies of scale.

Equity to Assets significantly increases ROA which is consistent with our initial hypothesis. Profitability and NPL to total loan and loan loss provision to total asset has a negative impact and these two are also consistent with our initial hypotheses. CAR has an insignificant negative impact on ROA which also differs with initial hypothesis.

- With the exception of equity to asset, all other independent factors have a negative effect on profitability, much like ROA. Banks must prioritize attaining economies of scale while concentrating on reducing NPL in order to boost ROE. the state of state-owned banks in terms of asset quality and capital sufficiency.
- Bank size and CAR are positively related to NIM but these factors put a negative impact in the case of ROA and ROE. Here only NPL to total loan has a significant impact on profitability.

6.2 Scope for further study

The influence of asset quality and capital sufficiency on the profitability of traditional banks in Bangladesh has been assessed based on our research. But we did not include many other variables and has untouched other types of banks in this study. The possible research areas may be as follows:

- a) Capital adequacy and asset quality's impact on private commercial banks of Bangladesh.

- b) The effect that asset quality and capital sufficiency have on Bangladeshi banks of all stripes.
- c) The viability of international banks in terms of asset quality and capital sufficiency.
- d) The state of state-owned banks in terms of asset quality and capital sufficiency.

This section focuses on the main findings of the entire study. There is also a direction for future researchers for further study in this area.

Chapter – 07

Conclusion

For conventional banks in Bangladesh:

- A negative correlation exists between CAR, ROA, and ROE.
- ROA and profitability are significantly positively impacted by the equity to asset ratio.
- A negative relation exists between Bank size and ROA and ROE which reflects there is a lacking economies of scale.
- However, we saw a favorable effect on bank profitability and size.
- There is always a negative impact on profitability with NPL to total loan and loan loss provision to total asset as banks do not get back their disbursed assets when non-performing loan increases. As a result, the cost of funding increases, decreasing the income from assets.
- ROA and ROE decreases due to lower net income which in turn decreases profitability.
- Due to diminishing interest income NIM decreases. This creates a barrier for lending more. Therefore, profit in terms of ROA, ROE and NIM decreases.
- Based on our research on Bangladeshi conventional banks, we can conclude that bank size and CAR have a negative relationship with ROA and ROE but a good relationship with profitability and NIM.

For a growing economy like Bangladesh, it is urgent for banks to undercut those factors that lead to a reduction in banks' profitability. As the banking sector of Bangladesh is profit-oriented they should be more conscious about the factors that increase or decrease profit. Of Bangladesh's 34 conventional banks, 20 banks make up the sample size used in this study and the datas' we have worked with covers the period 2009-2018 which counts 200 years for 10 years of each 20 banks. To find out the results/outcome, different tests have been carried out such as factor analysis, regression analysis along with model summary, analysis of variance, coefficient analysis, correlation analysis and trend analysis. Based on the literature review hypothesis are developed. We have used SPSS and Excel in order to do these analyses. It has been ensured by the data analysis through the factor analysis that our sample size is adequate as the KMO test turns into .50. Out of 5 independent variables there are three best components with eigenvalue greater than 1. For three dependent variables three regression analysis have been done. We have found that in the model summary and correlation analysis the adjusted R square is lower in most cases. The expected versus actual sign table of the data analysis has revealed the difference and similarity of the actual results along with the hypothesis.

Based on our research on Bangladeshi conventional banks, we can conclude that bank size and CAR have a negative relationship with ROA and ROE but a good relationship with profitability and NIM. In summary, this research indicates a favorable correlation between Equity to Asset and ROA, ROE, and NIM. However, loan loss provision to total assets and NPL to total loan have a negative effect on profitability.

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Appendix

Data of Variables (Source: Banks' Financial Statement)

<u>Bank</u>	<u>Year</u>	<u>CAR</u>	<u>ETA</u>	<u>Size</u>	<u>NPLTL</u>	<u>LLPTA</u>	<u>ROA</u>	<u>ROE</u>	<u>NIM</u>
AB Bank	2009	0.1109	0.095	12.4144	0.027497178	0.00173344	0.0352	0.3984	0.0291
Bank Asia	2009	0.1001	0.0722	8.83438	0.0156	0.0052	0.0218	0.3203	0.0267
IFIC Bank	2009	0.135	0.0667	11.0493	0.061385405	0.015134654	0.0166	0.2252	0.0234
National Bank	2009	0.116	0.1269	11.7643	0.014588749	0.006069048	0.0285	0.096	0.045
Pubali Bank	2009	0.1105	0.0668	11.586	0.01975284	0.003665658	0.0298	0.1195	0.0389
The City Bank	2009	0.113	0.0767	11.2446	0.049	0.009258896	0.012	0.162	0.0364
UCBL	2009	0.0922	0.0631	11.4129	0.0263	0.006476299	0.012	0.1849	0.0362
Uttara Bank	2009	0.1287	0.07758	11.1837	0.072038001	0.012649765	0.0154	0.178	0.0254
Dhaka Bank	2009	0.1131	0.0639	11.2615	0.0557	0.01913408	0.0129	0.1932	0.0456
DBBL	2009	0.116	0.0532	11.3081	0.024649357	0.0052	0.016	0.303	0.048
EBL	2009	0.1134	1.2064	11.1544	0.024586725	0.01081994	0.0234	0.221	0.0425
Prime Bank	2009	0.1471	0.09982	11.7345	0.012873661	0.005055847	0.0237	0.3019	0.0229
NCC Bank	2009	0.1355	0.0915	11.2533	0.0284	0.009337706	0.0261	0.2849	0.0316
MTB	2009	0.092	0.06982	10.8738	0.0281	0.021601137	0.0179	0.2661	0.0256
Mercantile Bank	2009	0.1048	0.0649	11.0999	0.0259	0.009521363	0.0132	0.188	0.0358
One Bank	2009	0.109	0.09935	10.718	0.0388	0.01392733	0.0189	0.16202	0.02292
Jamuna Bank	2009	0.1283	0.0506	10.7941	0.022	0.009562701	0.023	0.3006	0.0722
Standard Bank	2009	0.1356	0.08616	10.7996	0.0183	0.007448828	0.0184	0.2001	0.0327
Premier Bank	2009	0.1514	0.09796	10.7652	0.0183	0.002610734	0.023	0.2347	0.02294
Trust Bank	2009	0.1266	0.06927149	10.9006	0.0265	0.003837143	0.0132	0.1759	0.05265
AB Bank	2010	0.0991	0.1045	12.5603	0.021044976	0.003231466	0.0308	0.3077	0.0348
Bank Asia	2010	0.0811	0.0671	9.26102	0.0162	0.0034	0.0222	0.3212	0.0299
IFIC Bank	2010	0.0978	0.0826	11.15	0.047600025	0.019018184	0.0249	0.3312	0.0366
National Bank	2010	0.1232	0.13245643	11.892	0.018706848	0.00650868	0.0305	0.1065	0.0354
Pubali Bank	2010	0.1123	0.066302	11.7634	0.0204	0.004128048	0.0252	0.1326	0.049

The City Bank	2010	0.112	0.1267	11.4175	0.044	0.010671302	0.022	0.213	0.047
UCBL	2010	0.0631	0.0602	11.7743	0.012	0.002679458	0.0198	0.3228	0.0347
Uttara Bank	2010	0.1311	0.077654	11.3078	0.055034958	0.011687894	0.0191	0.1802	0.0203
Dhaka Bank	2010	0.1009	0.1063	11.4091	0.0457	0.01643018	0.02	0.2552	0.0524
DBBL	2010	0.096	0.0692	11.5247	0.024619519	0.0046	0.022	0.353	0.042
EBL	2010	0.1081	0.1472	11.3157	0.019946423	0.007442325	0.0319	0.2364	0.0444
Prime Bank	2010	0.1169	0.08546	11.9469	0.011787311	0.004159594	0.0222	0.2165	0.0421
NCC Bank	2010	0.1091	0.112	11.5233	0.0227	0.007351054	0.0284	0.2535	0.0438
MTB	2010	0.1149	0.07611	10.96	0.0228	0.022301796	0.0179	0.2452	0.0275
Mercantile Bank	2010	0.0913	0.0825	11.3753	0.0178	0.007092036	0.0186	0.1984	0.0359
One Bank	2010	0.0969	0.126089	10.9808	0.031	0.014335331	0.0363	0.25479	0.0317
Jamuna Bank	2010	0.095	0.0591	11.1565	0.0182	0.006484417	0.018	0.2052	0.0614
Standard Bank	2010	0.1032	0.08446	11.1064	0.0196	0.007688149	0.0237	0.2783	0.038
Premier Bank	2010	0.1001	0.09198	11.1308	0.0466	0.006333529	0.026	0.2823	0.02629
Trust Bank	2010	0.0906	0.086227	10.9729	0.0241	0.002350882	0.0227	0.2904	0.05173
AB Bank	2011	0.1137	0.0971	12.6598	0.028233902	0.003274721	0.0093	0.0925	0.0239
Bank Asia	2011	0.1488	0.106	9.37356	0.0272	0.0066	0.0172	0.1961	0.0249
IFIC Bank	2011	0.1013	0.0717	11.4245	0.039881809	0.010945915	0.0093	0.1215	0.0297
National Bank	2011	0.1265	0.127324	12.0379	0.026663999	0.006302156	0.0401	0.2996	0.038
Pubali Bank	2011	0.1156	0.078487	11.965	0.020186095	0.00492416	0.02	0.1817	0.0631
The City Bank	2011	0.128	0.1543	11.6591	0.034	0.00951303	0.02	0.137	0.045
UCBL	2011	0.1087	0.0945	12.037	0.0179	0.003043369	0.0197	0.2477	0.0373
Uttara Bank	2011	0.1329	0.0822	11.4868	0.052247442	0.011209439	0.0169	0.1713	0.0198
Dhaka Bank	2011	0.107	0.088	11.5591	0.0345	0.010150297	0.0222	0.2349	0.041
DBBL	2011	0.112	0.0725	11.7221	0.027451428	0.0019	0.019	0.27	0.049
EBL	2011	0.1018	0.1225	11.6751	0.019089197	0.007363883	0.0252	0.1903	0.0376
Prime Bank	2011	0.1246	0.0829	12.2058	0.013741646	0.003890973	0.0205	0.2019	0.0319
NCC Bank	2011	0.1126	0.1095	11.7252	0.0268	0.006308307	0.0212	0.1898	0.0431
MTB	2011	0.1196	0.06308	11.2428	0.0254	0.019428541	0.0061	0.0884	0.0386
Mercantile Bank	2011	0.1052	0.0829	11.6661	0.0261	0.006108809	0.017	0.1795	0.0293
One Bank	2011	0.1124	0.14194	11.1216	0.0538	0.015306349	0.0229	0.15097	0.02897
Jamuna Bank	2011	0.1127	0.0764	11.3744	0.0286	0.007201516	0.0169	0.1943	0.0382
Standard Bank	2011	0.1139	0.09167	11.2246	0.0219	0.007204515	0.0183	0.2075	0.0368
Premier Bank	2011	0.1055	0.08903	11.2246	0.0428	0.00568905	0.0068	0.0766	0.0276
Trust Bank	2011	0.1184	0.072518	11.2413	0.0302	0.003358919	0.0092	0.1168	0.04626
AB Bank	2012	0.1173	0.0922	12.6589	0.03320574	0.003334764	0.0088	0.0931	0.0312
Bank Asia	2012	0.1305	0.0929	9.54939	0.0569	0.0188	0.007	0.0711	0.0285
IFIC Bank	2012	0.1018	0.0676	11.6503	0.0530845	0.019262784	0.0107	0.1543	0.0325
National Bank	2012	0.128	0.109032	12.2318	0.0432	0.006290467	0.008	0.0678	0.043
Pubali Bank	2012	0.122	0.087139	12.1702	0.050460348	0.014438455	0.0091	0.0937	0.0745
The City Bank	2012	0.117	0.138	11.7767	0.075	0.026193293	0.006	0.043	0.0435
UCBL	2012	0.1037	0.0898	12.2426	0.0369	0.008917881	0.0084	0.0929	0.0395
Uttara Bank	2012	0.1237	0.086853	11.7263	0.084167909	0.014568958	0.01	0.1262	0.0151
Dhaka Bank	2012	0.1074	0.0727	11.7992	0.0628	0.018761923	0.0059	0.0724	0.041

DBBL	2012	0.12	0.0696	11.9571	0.029770134	0.0025	0.017	0.234	0.053
EBL	2012	0.1205	0.1163	11.8992	0.031751447	0.009425884	0.0172	0.1444	0.043
Prime Bank	2012	0.1264	0.0887	12.3751	0.038336752	0.008229427	0.0124	0.1353	0.0361
NCC Bank	2012	0.1147	0.0964	11.9182	0.0551	0.011369572	0.0114	0.1181	0.0389
MTB	2012	0.107	0.051888	11.4421	0.0369	0.019621734	0.0039	0.0647	0.0246
Mercantile Bank	2012	0.1083	0.0071	11.945	0.0437	0.009711763	0.0102	0.1342	0.0299
One Bank	2012	0.1046	0.12553	11.3577	0.0345	0.011154197	0.0138	0.09816	0.03215
Jamuna Bank	2012	0.1221	0.0342	11.6053	0.0973	0.015481542	0.0106	0.1335	0.0303
Standard Bank	2012	0.1128	0.086804	11.4584	0.025	0.008986652	0.0157	0.1767	0.0314
Premier Bank	2012	0.1104	0.08745	11.3112	0.0539	0.006883304	0.0074	0.0844	0.02633
Trust Bank	2012	0.1386	0.0683700	11.4644	0.0458	0.004870829	0.0021	0.0302	0.04173
AB Bank	2013	0.108	0.0814	12.6839	0.033685172	0.007047494	0.0053	0.0613	0.0378
Bank Asia	2013	0.1105	0.0893	9.70368	0.056	0.0188	0.0096	0.1055	0.0211
IFIC Bank	2013	0.1037	0.0689	11.7907	0.037664963	0.012271147	0.0109	0.1598	0.0257
National Bank	2013	0.1169	0.10175300	12.3681	0.0324	0.006166928	0.0096	0.0914	0.0416
Pubali Bank	2013	0.1173	0.092931	12.3394	0.059413412	0.021423355	0.0101	0.1135	0.0539
The City Bank	2013	0.116	0.1256	11.9014	0.081	0.024716556	0.007	0.073	0.0407
UCBL	2013	0.1153	0.0111	12.3298	0.0403	0.007374086	0.0141	0.1585	0.0368
Uttara Bank	2013	0.1245	0.086498	11.7935	0.080356564	0.010722473	0.0099	0.1227	0.0078
Dhaka Bank	2013	0.1218	0.0822	11.8804	0.0415	0.015137561	0.0139	0.1621	0.0432
DBBL	2013	0.137	0.0681	12.131	0.039235953	0.0056	0.012	0.17	0.055
EBL	2013	0.1195	0.1169	11.9696	0.035924594	0.012217986	0.0168	0.1444	0.0388
Prime Bank	2013	0.1203	0.0885	12.4044	0.05088255	0.015307399	0.0076	0.0835	0.0275
NCC Bank	2013	0.1186	0.1069	11.9201	0.0556	0.017724771	0.0092	0.0858	0.0293
MTB	2013	0.1157	0.0537	11.5275	0.0362	0.022638571	0.0059	0.1115	0.0285
Mercantile Bank	2013	0.1143	0.0087	11.8834	0.0477	0.016742381	0.0133	0.1684	0.0358
One Bank	2013	0.1209	0.143488	11.5395	0.0328	0.008150666	0.0143	0.09155	0.02968
Jamuna Bank	2013	1110	0.0633	11.6586	0.0759	0.019510382	0.0101	0.132	0.0145
Standard Bank	2013	0.1067	0.08507	11.6009	0.035	0.014579956	0.0099	0.1155	0.0254
Premier Bank	2013	0.1146	0.08883	11.4066	0.0573	0.006719829	0.0087	0.0984	0.02124
Trust Bank	2013	0.1174	0.058814	11.6677	0.0312	0.004565702	0.0031	0.0485	0.03928
AB Bank	2014	0.10794	0.0784	12.4144	0.038609908	0.011870207	0.0059	0.0644	0.0387
Bank Asia	2014	0.1132	0.0923	9.81319	0.0531	0.0218	0.0128	0.1409	0.04281
IFIC Bank	2014	0.1016	0.068	11.9598	0.049480847	0.022521572	0.0091	0.1247	0.0421
National Bank	2014	0.11709	0.10510726	12.455	0.0526	0.006297365	0.0106	0.0934	0.0411
Pubali Bank	2014	0.11961	0.0888512	12.4227	0.062530422	0.022303905	0.0135	0.1404	0.0499
The City Bank	2014	0.15545	0.107	12.0585	0.05881445	0.017222496	0.0142	0.1053	0.0484
UCBL	2014	0.10581	0.0845	12.4916	0.046225581	0.006580215	0.014	0.1446	0.043
Uttara Bank	2014	0.11916	0.080668	11.8552	0.079179071	0.010950903	0.0099	0.1208	0.0544
Dhaka Bank	2014	0.112	0.0803	11.9751	0.0549	0.013354499	0.0134	0.1592	0.0444
DBBL	2014	0.138	0.0672	12.283	0.04400553	0.0037	0.011	0.162	0.05792
EBL	2014	0.1322	0.1167	12.056	0.043595878	0.013995724	0.0128	0.1093	0.02733

Prime Bank	2014	0.1271	0.0763	12.5033	0.07610252	0.017034522	0.0091	0.1008	0.0191
NCC Bank	2014	0.1342	0.1054	12.0417	0.0741	0.015942554	0.0116	0.1087	0.0256
MTB	2014	0.1077	0.05821	11.6639	0.0267	0.008211451	0.0088	0.1574	0.0244
Mercantile Bank	2014	0.1295	0.0802	12.0345	0.0413	0.0142752	0.0076	0.0911	0.0382
One Bank	2014	0.1347	0.08393	11.7103	0.0472	0.005795436	0.0187	0.112	0.05081
Jamuna Bank	2014	0.1125	0.0628	11.8486	0.056	0.012845348	0.0106	0.1371	0.0216
Standard Bank	2014	0.1105	0.08243	11.6947	0.0355	0.012932328	0.0106	0.1227	0.0327
Premier Bank	2014	0.0921	0.080714	11.6171	0.0903	0.011361998	0.0086	0.0964	0.02043
Trust Bank	2014	0.1193	0.055928	11.8869	0.0245	0.003845995	0.0099	0.1058	0.03541
AB Bank	2015	0.11079	0.08	12.5603	0.031560377	0.009108452	0.0049	0.0505	0.0277
Bank Asia	2015	0.1246	0.1292	10.0184	0.0426	0.013	0.0126	0.1436	0.03318
IFIC Bank	2015	0.10092	0.0653	12.0914	0.064590449	0.022598046	0.0054	0.0805	0.0391
National Bank	2015	0.12174	0.11918192	12.5481	0.0701	0.006911551	0.0145	0.1286	0.0412
Pubali Bank	2015	0.11893	0.09745997	12.5619	0.053244765	0.019529745	0.0125	0.1388	0.0452
The City Bank	2015	0.14763	0.0994	12.2559	0.075792519	0.02201017	0.015	0.1418	0.0537
UCBL	2015	0.12231	0.0871	12.5908	0.052296455	0.005690032	0.0135	0.1193	0.0465
Uttara Bank	2015	0.12636	0.07914090	11.9282	0.082737514	0.011764217	0.0101	0.1259	0.0632
Dhaka Bank	2015	0.1046	0.0759	12.0803	0.0466	0.010790306	0.0086	0.1074	0.0402
DBBL	2015	0.137	0.0686	12.4052	0.036940303	0.0068	0.013	0.193	0.05695
EBL	2015	0.1424	0.1081	12.1525	0.032735398	0.014881596	0.0123	0.1095	0.02162
PrimeBank	2015	0.1274	0.0667	12.4962	0.078247127	0.021505899	0.008	0.0841	0.0086
NCC Bank	2015	0.1352	0.107	12.1042	0.0707	0.017548496	0.0097	0.0912	0.0248
MTB	2015	0.1202	0.06113	11.8918	0.0208	0.00809262	0.0104	0.174	0.0294
Mercantile Bank	2015	0.1187	0.0849	12.1161	0.0495	0.013955142	0.0079	0.096	0.0327
One Bank	2015	0.1093	0.07509	11.946	0.0358	0.009403799	0.0139	0.1174	0.04235
Jamuna Bank	2015	0.1274	0.0617	11.8736	0.066	0.010806364	0.0116	0.1237	0.0208
Standard Bank	2015	0.1218	0.086713	11.793	0.0323	0.011917987	0.0127	0.1391	0.0263
Premier Bank	2015	0.0901	0.081361	11.785	0.0664	0.009234684	0.0079	0.09	0.01924
Trust Bank	2015	0.1081	0.052777	12.102	0.0274	0.004316706	0.0095	0.1136	0.03583
AB Bank	2016	0.10499	0.0734	12.6598	0.051949774	0.0079597	0.0057	0.0605	0.0294
Bank Asia	2016	0.1242	0.0752	10.1393	0.0541	0.0178	0.0065	0.0813	0.03356
IFIC Bank	2016	0.11668	0.0652	12.1912	0.05288146	0.023734972	0.008	0.0895	0.0375
National Bank	2016	0.13578	0.11848583	12.6301	0.1035	0.007623927	0.0224	0.178	0.0316
Pubali Bank	2016	0.11195	0.10997602	12.6772	0.053795115	0.023979124	0.0062	0.0764	0.0426
The City Bank	2016	0.13564	0.0811	12.4481	0.060459934	0.016532169	0.0153	0.1597	0.0489
UCBL	2016	0.11857	0.0781	12.706	0.080108361	0.005283258	0.0101	0.0967	0.0436
Uttara Bank	2016	0.13439	0.09889353	11.9979	0.077555873	0.012252359	0.0097	0.1263	0.0534
Dhaka Bank	2016	0.1367	0.0714	12.217	0.0401	0.011914418	0.0077	0.1015	0.0458
DBBL	2016	0.131	0.0667	12.4867	0.051898006	0.0086	0.007	0.103	0.05225
EBL	2016	0.151	0.0974	12.2605	0.026932485	0.016454767	0.0133	0.1294	0.03009
Prime Bank	2016	0.1245	0.0664	12.5144	0.059566893	0.013911338	0.0081	0.0849	0.0202
NCC Bank	2016	0.1197	0.0958	12.2739	0.0577	0.015473973	0.013	0.1291	0.028
MTB	2016	0.1129	0.05936	12.0159	0.0436	0.012402416	0.0094	0.1561	0.0355

Mercantile Bank	2016	0.1303	0.0823	12.2265	0.0513	0.015269906	0.0115	0.1378	0.0343
One Bank	2016	0.1389	0.06861	12.1455	0.0493	0.007060098	0.012	0.0927	0.03665
Jamuna Bank	2016	0.1082	0.0641	12.0387	0.0401	0.00950467	0.0115	0.1138	0.0254
Standard Bank	2016	0.1138	0.082289	11.9368	0.0362	0.01239618	0.0076	0.0866	0.0274
Premier Bank	2016	0.1238	0.07707	11.9485	0.0517	0.007610299	0.0111	0.1332	0.01978
Trust Bank	2016	0.1462	0.053153	12.256	0.0321	0.004680321	0.0103	0.1039	0.03483
AB Bank	2017	0.10025	0.0724	12.6589	0.071453143	0.012277272	0.0001	0.0013	0.0253
Bank Asia	2017	0.1489	0.0729	10.2716	0.0438	0.0129	0.0076	0.1021	0.03156
IFIC Bank	2017	0.12869	0.0811	12.4421	0.064028472	0.023332767	0.0072	0.0885	0.034
National Bank	2017	0.13942	0.11509500	12.7679	0.1064	0.007135917	0.0186	0.1548	0.0404
Pubali Bank	2017	0.1314	0.18978177	12.8167	0.086778826	0.033655974	0.0063	0.0861	0.0406
The City Bank	2017	0.15239	0.0903	12.5265	0.054314432	0.013562902	0.0147	0.1383	0.0403
UCBL	2017	0.12317	0.73	12.803	0.073823189	0.006594832	0.0073	0.0998	0.0382
Uttara Bank	2017	0.13133	0.10571651	12.0945	0.067490025	0.012595064	0.0089	0.1142	0.047
Dhaka Bank	2017	0.1196	0.0664	12.3435	0.0598	0.019206548	0.0069	0.0921	0.039
DBBL	2017	0.13	0.0625	12.6505	0.046533924	0.0013	0.009	0.132	0.04973
EBL	2017	0.1409	0.0853	12.4414	0.024996332	0.01730365	0.0104	0.1141	0.0259
Prime Bank	2017	0.1401	0.0678	12.5471	0.054451576	0.015177318	0.0038	0.0424	0.0256
NCC Bank	2017	0.1151	0.0844	12.4555	0.0579	0.015013476	0.0094	0.1049	0.0285
MTB	2017	0.1376	0.05829	12.2148	0.043	0.011885762	0.0108	0.1835	0.0309
Mercantile Bank	2017	0.1193	0.0676	12.4691	0.0379	0.015247723	0.013	0.1755	0.0292
One Bank	2017	0.1156	0.06209	12.3336	0.0531	0.007746411	0.0105	0.1538	0.03327
Jamuna Bank	2017	0.1184	0.0637	12.1943	0.0399	0.009106132	0.0113	0.1331	0.0289
Standard Bank	2017	0.1396	0.07632	12.0765	0.0844	0.01247019	0.0075	0.0924	0.0222
Premier Bank	2017	0.1212	0.071765	12.1127	0.0469	0.007000922	0.0113	0.146	0.02475
Trust Bank	2017	0.1292	0.050515	12.3874	0.0335	0.00780745	0.0077	0.1643	0.03469
AB Bank	2018	0.09694	0.0702	12.6839	0.330725515	0.015747568	0.0004	0.005	0.0204
Bank Asia	2018	0.1505	0.076	10.333	0.1505	0.041	0.0076	0.1021	0.0368
IFIC Bank	2018	0.1255	0.0781	12.5535	0.061566713	0.021033444	0.0047	0.0615	0.0259
National Bank	2018	0.13338	0.1100352	12.9171	0.095	0.005009486	0.0151	0.7313	0.0401
Pubali Bank	2018	0.12703	0.13486990	12.9233	0.054549481	0.031267465	0.0132	0.1839	0.0408
The City Bank	2018	0.13655	0.0752	12.6909	0.053269142	0.013818585	0.0069	0.0913	0.0379
UCBL	2018	0.129	0.0698	12.9019	0.067943571	0.0092925	0.0071	0.1	0.0357
Uttara Bank	2018	0.12327	0.08627164	12.1549	0.06244686	0.017465673	0.0093	0.1196	0.0517
Dhaka Bank	2018	0.1384	0.0606	12.5208	0.0499	0.015519608	0.0054	0.0818	0.0379
DBBL	2018	0.156	0.0666	12.7555	0.041376112	0.0013	0.013	0.197	0.062
EBL	2018	0.1216	0.0813	12.5513	0.02353492	0.01457952	0.0115	0.1383	0.03027
Prime Bank	2018	0.1704	0.0713	12.591	0.061639376	0.015539246	0.0076	0.086	0.0362
NCC Bank	2018	0.1262	0.0735	12.6657	0.058	0.013315122	0.0082	0.1045	0.0297
MTB	2018	0.1286	0.05969	12.3124	0.0539	0.014309155	0.0082	0.1385	0.0334

Mercantile Bank	2018	0.1328	0.0641	12.5824	0.0482	0.013254	0.0109	0.1655	0.0301
One Bank	2018	0.1193	0.05409	12.4914	0.0705	0.0114377	0.0056	0.1372	0.0392
Jamuna Bank	2018	0.1361	0.063	12.3263	0.0374	0.007368981	0.0109	0.1373	0.0339
Standard Bank	2018	0.0997	0.07515	12.1917	0.081	0.011519265	0.0067	0.0847	0.0244
Premier Bank	2018	0.1227	0.07069	12.2836	0.0399	0.005799207	0.0112	0.1571	0.0308
Trust Bank	2018	0.1404	0.04964	12.467	0.079	0.008419415	0.0076	0.1427	0.0352