Chapter 1

Introduction

1.1 Introduction

Risk based Capital Adequacy is also known as Capital to Risk (Weighted) Assets Ratio (CRAR), It is the ratio of a bank's capital to its risk. National regulators track a bank's CAR to ensure that it can absorb a reasonable amount of loss and complies with statutory Capital requirements.

It is a measure of a bank's capital. It is expressed as a percentage of a bank's risk-weighted credit exposures. The enforcement of regulated levels of this ratio is intended to protect depositors and promote stability and efficiency of financial systems around the world. Two types of capital are measured: tier one capital, which can absorb losses without a bank being required to cease trading, and tier two capital, which can absorb losses in the event of a winding-up and so provides a lesser degree of protection to depositors. Capital adequacy ratio is the ratio which determines the bank's capacity to meet the time liabilities and other risks such as credit risk, operational risk etc. In the most simple formulation, a bank's capital is the "cushion" for potential losses, and protects the bank's depositors and other lenders. Banking regulators in most countries define and monitor CAR to protect depositors, thereby maintaining confidence in the banking system.

To cope up with the international best practices and to make the bank's capital shock absorbent 'Guidelines on Risk Based Capital Adequacy (RBCA) for banks' (Revised regulatory capital framework in line with Basel II) was introduced from January 01, 2009 as a parallel run with BRPD Circular No. 10, dated November 25, 2002 (Basel I). At the end of parallel run, Basel II regime started from January 01, 2010 and the guidelines on RBCA came fully into force with its subsequent supplements/revisions. Instructions regarding Minimum Capital Requirement (MCR), Adequate Capital and Disclosure requirement as stated in the guidelines had to be followed by all scheduled banks for the purpose of statutory compliance. Basel III reforms are the response of Basel Committee on Banking Supervision (BCBS) to improve the banking sector's ability to absorb shocks arising from financial and economic stress, whatever the source, thus reducing the risk of spillover from the financial sector to the real economy. "Basel III: A global

regulatory framework for more resilient banks and banking systems" (known as Basel III capital regulations) in December 2010. Basel III reforms strengthen the bank-level i.e. micro prudential regulation, with the intention to raise the resilience of individual banking institutions in periods of stress. Besides, the reforms have a macro prudential focus also, addressing system wide risks, which can build up across the banking sector, as well as the procyclical amplification of these risks over time.

1.2 Objective of the study

- To draw clear picture risk based capital adequacy
- To identify the major areas risk based capital adequacy
- To examine RAKUB policy and implementation

Chapter 2

Literature Review

Initially, Moldigliani and Miller's (1958) illustrated that a firm's capital structure is irrelevant to its value in an efficient market. As banks are joint-stock corporations, the shareholders' losses are limited while their gainsare much larger than the fix amount of interest payment for depositors and creditors. In an efficient market with all information published, creditors require higher loan interest to cover the higher risk, which forces managers to maximize both share value and bank total value. Hence, the market value of bank is independent of its capital structure. In other words, there is no need for capital regulation in this framework.

However, Sealey (1985), Baltensperger & Milde (1987) argued that M&M theorem is not appropriate for banks. According to the information theory, if market was efficient, banks which do not possess special information would not exist. Therefore, bank's appearance proves that M&M's assumptions have problems. Since creditors are unable to accurately assess the portfolio's risks, banks have incentives to increase leverage and take higher risk. As a result, regulators should implement certain requirements for banks, especially in terms of capital, to avoid default.

In addition, Koehn & Santomero (1980) found that capital requirement was not enough to reduce the failure probability. Because a high required capital level would have undesirable effects onbanks' expected returns; forcing banks to balance their loss by investing in high risk assets. Another words, the degree of risk aversion played a key role in bankruptcy probability. Researchers indicated that the failure's probability was lower for sufficiently risk-averse banks and higher for low risk-averse bank. Consequently, capital regulations need to combine with asset requirements and take into account the liquidity problem.

In the later discussion, Kim and Santomero (1988) also suggested that policy makers might implement risk-sensitive capital requirements. Specifically, optimally chosen risk-weights withan upper bound on the bankruptcy's probability should depend on the expected returns and their variance - covariance structure. Hence, they were independent of individual risk aversion.

Mpuga (2002) believed that inadequate minimum capital requirements might induce banks going bankruptcy. He analyzed how new Ugandan capital regulations led to a large number of banks collapse when they took efforts to meet capital requirements in the 1998 crises. The research empirically further concluded that once new regulations took additional elements, such as deposits, paid-in capital, core capital, total capital, etc. into account, banks performance would-be strengthened. Similarly, Choi (2000) found that banks changed their behaviors when an old regulation was replaced. In particular, banks satisfying CAR extended their credit and low-CAR banks had to reduce their lending to adapt with mandatory capital.

Dowd (1999) proved that minimum capital regulations might be considered as a mean to enhance the safety and soundness of banking industry. He appreciated deposit insurance system to deal with information asymmetry. Its moral hazard made the Government establish intervention in bank performance by capital regulations. At the same time, Harold (1999) independently found that not only regulators but also residents concerned about the stabilization of financial system. By using the bank risk-based capital approach for banks and credit unions strength comparison, the research inferred that asset size was not a main source causing the difference in these bank risk-based capital ratios. Therefore, banks would maintain an appropriate capital level to optimize the return on equity as well as adapt capital adequacy regulations.

Jackson *et al.* (1999) conducted a study to verify the relationship between banks' profitability and capital requirement in banking sector of Germany, Canada, Holland, Japan, England, United States, and Switzerland. However, the authors found inconclusively divergent results from their data.

Olalekan, A., *et al.,* (2013). profoundly examined the function of capital requirements in dealing with both adverse selection and moral hazard. Theoretically, the former derived from private quality of the bank's loans towards banks' owners while the latter arose as banks' profit depending on the unobservable decision.

Powell, A., (2002). argued that the framework in which borrowing rates are constant and costs are independent of portfolio risk are incorrect because it ignores the states in which bank fails. Once bank fails, depositors are paid a deposit insurance agencies' compensation, decreasing the cost of debts. Therefore, the probability of bank to take more risk is greater at low capital levels, and it decreases with the increase in capital.

Rime, B., (2001). Analyzed the influences of loan loss provision (LLP)on stock price during the period from 1980 to 1993. He explained investors' reaction from LLP announcement in terms of information asymmetry on asset value and cost of capital. The regression on cumulative average expected earnings indicated that LLP declaration brought negative effects on earnings. Thus, banks with lower capital adequacy faced a larger reduction in stock price in comparison to the ones with adequate CAR. Eventually, of plentiful types of LLP, real estate and loans provision made an enormously negative price reaction. Whilst, Powel (2002) believed that there was a shortage of provisioning capital rules in international agreement of Basel I, which cover both expected and unexpected loss.

Chapter 3

Methodology of the study

3.1 Research Methodology

The research is conducted on the basis of primary and secondary data are collected from different sources. I had to collect enough information so that I can make an effective analysis of risk based capital adequacy.

3.2 Sources of data

For collecting the required data, I have used different sources or methods like the following:

- ✓ **Primary data:**
  - ❖ Interviews of the customer
  - ❖ Interviews of the bank employee
  - ❖ Direct observation
- ✓ **Secondary data:**
  - ❖ Operational manual
  - ❖ Official website of both RAKUB and BB
  - ❖ Banking journals
  - ❖ RAKUB newsletters
  - ❖ Research papers

3.3 Research Technology

Different types of software like Ms-Excel, Ms-Word, diagram etc. are used to prepare the report. Final report is prepared accordingly in the form of word form.

3.4 Limitation of the study

- Bank is a sophisticate business sector. So bank do not interested to provide confidential data.
- Time is one of the important limitations of this report.
- Sometimes employees were very busy to give their valuable time.
- Lack of experience of making internship report is one of the limitations of this study.
- Large scale analysis was not possible due to constraints & restrictions posted by the banking authority.
- In many cases, up to date information was not published.
- In some cases, access to relevant papers & documents were strictly prohibited.

Chapter 4

Organizational profile

4.1 An Overview of the Bank

Rajshahi Krishi Unnayan Bank welcomes to all to explore the world of progressive Banking in Bangladesh. It is a state owned commercial bank and is catering the need of the mass business people. Immediately after the independence of Bangladesh in 1971, the erstwhile United Bank and Union Bank Limited were nationalized and renamed as Rajshahi Krishi Unnayan Bank. It was corporazed on 15th November 2007. Rajshahi Krishi Unnayan Bank was born with a new concept of purposeful banking sub serving the growing and diversified financial needs of planned economic development of the country. The noble intention behind starting of this Bank was to bring about a qualitative change in the sphere of banking and financial management. Rajshahi Krishi Unnayan Bank is playing a significant role towards socio-economic development of the country by financing Non-Banking Financial Institutions dealing with Home Loan, Corporate Financing & Loan Syndication. Rajshahi Krishi Unnayan Bank is always vigilant to develop its market potentialities way before others are thinking/planning today. Rajshahi Krishi Unnayan Bank is the first among to start SWIFT operation to minimize transmission cost in lieu of the telex system and simultaneously increase remittance business and foreign trade. It has automated 92 branches and developed 20-application software by its own staff, which has reduced huge internal expenses and enriches operational efficiency as well. Rajshahi Krishi Unnayan Bank operates through 864 branches including 4 overseas branches at United Arab Emirates. It is linked with 1202 foreign correspondents all over the world. The Bank employs 15705 employees.

The mission of the bank is to actively participate in the socio- economic development of the nation by operating a commercially sound banking organization, providing credit to viable borrowers, efficiently delivered and competitively priced, simultaneously protecting depositor's funds and providing a satisfactory return on equity to the owners. The Board of Directors is composed of 13 (Thirteen) members headed by a Chairman. The Directors are representatives from both public and private sectors. The Bank is headed by the Chief Executive Officer & Managing Director, who is a reputed banker. The corporate head office is located at Dhaka with 10 (ten) Divisions comprising of 37 (thirty seven) Departments.

International Award -"World's Best Bank Award-2009 in Bangladesh

Rajshahi Krishi Unnayan Bank Limited was awarded Best Bank-Bangladesh in the Global Finance, World's Best Bank Awards, 2009 by New York based Financial Magazine "Global Finance". "Global Finance" has identified winning banks based on number of criteria including growth in Assets, Profitability, Strategic relationships, Customer Service, Competitive pricing and innovative products.

4.2 Objective of the bank

- To earn customer satisfaction through diversified banking activities and introduction of innovative banking.
- To improve the customer services in recent times by introducing a number of IT-based reform measures.
- To remain one of the best banks in Bangladesh in terms of profitability and Assets Quality.
- To ensure an adequate rate of return on investment.
- To maintain adequate liquidity to meet maturing obligations and commitments.
- To maintain a healthy growth of business with desired image.
- To maintain adequate control systems and transparency in procedures.
- To ensure optimum utilization of all available resources.

4.3 Values of the bank

- To have a strong customer focus arid build relationship based on integrity, superior service and mutual benefit.
- To work as a team to serve the best interests of the group.
- To work for business innovation and improvements.
- To value and respect the people and make decision based on the merit.
- To provide recognition and reward on performance.
- To be responsible, trustworthy and law-abiding in every sphere.
- To become the base bank in respect of service, profitability and strength.
- Provide greatest return to the shareholders by achieving sound profitable growth.

4.4 Mission of the bank

- To mobilize resources from within to the development and growth of the country.

- To play a catalyst role in the formation of capital market.
- Anticipating business solutions required by all our customers everywhere and innovatively supplying them beyond expectation.
- Setting industry benchmarks of world class standard in delivering customer value through our comprehensive product range, customer service and all our activities.
- Maintaining the highest ethical standards and a community responsibility worthy of a leading corporate citizen
- Continuously improving productivity and profitability and thereby enhancing shareholder value.

Information about the Administration of RAKUB

Office Automation: Technology, computer, internet these thins brings a new generation of banking service to the customer. Eight to ten years ago customers cannot think about that they can withdraw or deposit money from their account at least within one hour. But now it takes only at best five minutes for withdraw their money. This is the simple example what technology brings to banking sector. In before bankers has to maintain huge ledger book for their daily or any sorts of banking record. But now they can do it by on click and by strike of few buttons. They have web page (www.Rajshahi Krishi Unnayanbank-bd.com). Customer can get detail information from the web page. RKUB also has credit card and ATM machine now a days.

Audit Inspection Recovery Distribution: Head Office Audit and Inspection Division comprising sufficiently experienced and skilled manpower carried out internal audit and inspection work on regular basis. In 2002, all the branches of the Bank were audited at least once. Surprise inspections were also undertaken in many branches. Bangladesh Bank audit teams also conducted comprehensive and foreign exchange related inspections on the affairs of many branches during the year under report.

Human Resource Division: In the Rajshahi Krishi Unnayan Bank, this department deals with the employees as the core resources of the organization. This department mainly emphasize on the recruitment, selection of the employees. They are also motivating the employee to work efficiently and effectively.

Information Technology Division: It is very significant to adapt with the ongoing information technology revolution to provide faster services to the clients. The Information Technology Division supervises the overall computerization of the banking

operations and networking, provides system support, deals with data processing and data entry, procures and maintain hardware, maintain and develop software required by the bank to facilitate and support the day to day operations.

Training Division: The main objective of this division is to make the employees efficient. Usually this division offers training to their employee time to time. This is helpful to the employee to do their job efficiently and effectively.

Marketing Department: The Marketing department mainly works for to promote the different types of services of information to the people. To improve the marketing network throughout the country. To implements the marketing strategies and the concept of Trade marketing.

Credit Department: The credit department mainly deals with different types of loan and advances. This department analysis the proposal, approvable, monitoring thecredit, disbursement, credit recovery position and credit policy that is given by all branches.

International Banking Department: The foreign exchange department mainly deals with export, import and foreign currency of different branches of the Bank.

Common Services Department: They take care of Banks assets and utilize their assets properly.

Public Relation & Protocol Department:

This department deals with people & coveys people's views to the management.

Dead Stock & Stationery:

This department prints all security documents of Bank & looks after of this security items.

4.5 Organizational Structure of Rajshahi Krishi Unnayan Bank

There are 13 members of Board of Directors manages Rajshahi Krishi Unnayan Bank. For efficient operation of the bank the Board of directors forms an Executive Committee of 19 members. Besides, a management Committee looks after the affairs of the bank. The Bank maintains transparency in its entire works. All decisions of the management come through discussions in appropriate forum and required follow-ups are also made to

see their effectiveness. Here are the management team given in a chart and he hierarchy of the RAKUB is given in next page-

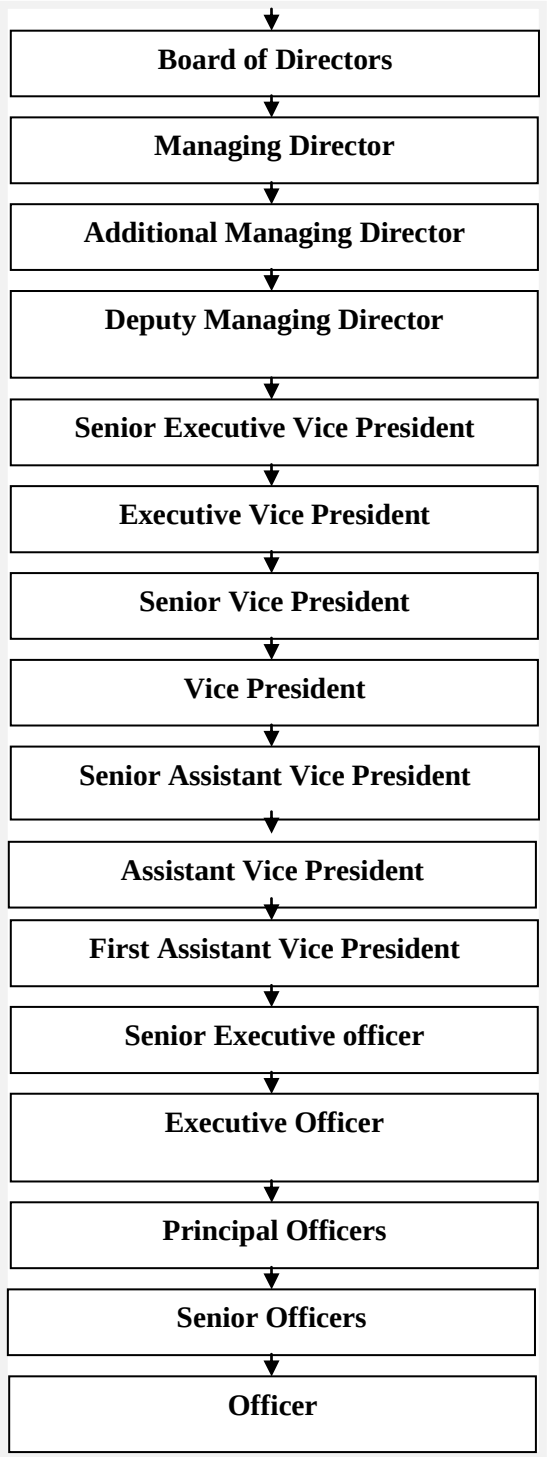

Figure 1: The Hierarchy of Rajshahi Krishi Unnayan Bank

4.6 Corporate Mission

Rajshahi Krishi Unnayan Bank creates new opportunities for its clients. It gives customized services & maintains harmonies banker client relationship. To mobilize financial resources from within & abroad to contribute to agricultures, industry & socio-economic development of the country & to pay a catalytic role in the formation of capital market. It also contributes trade commerce & industry of the country. To carry on the business dealer in foreign exchange including buying & selling of foreign exchange, dealing in foreign currency notes, granting & issuing of letters of credit & negotiating & discounting of export documents & all other matters related to foreign exchange business.

4.7 Corporate Vision

To become the bank of choice in serving the nation as a progressive & socially responsible financial institution by bringing credit & commerce together for profit & sustainable growth. And to be a leading Bank in South Asia.

4.8 Core Values

For Customers: To become most caring bank by providing the most courteous & efficient service in every area of our business.

For Employees: By providing the well-being of the members of the staff.

For Shareholders: By ensuring fair return on their investment through generating stable profit.

For Community: By assuming our role as a socially responsible corporate entity in a tangible through close adherence to national policies & objectives.

Chapter 5

Result and Discussion

5.1 Basel III: Capital Adequacy Framework

There are thousands of commercial banks in the world. These banks face a lot of risks everyday in many forms. Strong and well functioning banking industry is undoubtedly one of the main ingredients of a country's growth. With this perspective, in 1975, Basel Committee on Banking Supervision (BCBS) was formed. Its secretariat office is at the Bank for International Settlements in Basel, Switzerland. Its main objectives were to understand the supervisory issues related to banks and improve the supervisory quality globally. BCBS committee members come from 27 countries and help come up with standard guidelines for banks to follow (Wikipedia, 2011)4. It is not a body which can issue binding regulations; it is rather a forum where global best practice standards regarding risk management in banks are developed. Most countries are implementing the committee's policies and they are enforced through national laws and regulations in line with the recommended guidelines by BCBS (Wikipedia, 2011)5. The committee issued recommendations on banking laws and regulations known as Basel Accord (Basel I of 1988) which addressed minimum capital requirement for commercial banks (Wikipedia, 2011)6. The second installment of the accord came out in 2004 and is best known as Basel II (revised in 2006) which better addresses the issue of how banks and other depository institutions should handle their capital to guard against risks they face (Wikipedia, 2011)7.Basel III is an internationally agreed set of measures developed by the Basel Committee on Banking Supervision in response to the financial crisis of 2007-09. The measures aim to strengthen the regulation, supervision and risk management of banks.

Objectives

The main objectives of Basel III are:

- Ensuring that capital allocation is more risk sensitive
- Enhance disclosure requirements which will allow market participants to assess the capital adequacy of an institution

5.2 Scope of Basel III regulatory requirement in Bangladesh

As BCBS does not have the authority to issue binding laws in any country, so in Bangladesh, the central bank- Bangladesh Bank (BB) issues the guidelines under section 13 and section 45 of "Bank Company Act -1991". BB recognized the importance of Basel II and decided to implement the global standard guidelines for banking supervision. BB has made this requirement mandatory for all scheduled banks from January 01, 2014. The guidelines apply to banks on solo and consolidated basis. Solo basis means "the bank" only with all of its local and overseas branches. Consolidated basis means "the bank" and its subsidiaries, e.g. merchant banks, brokerage firms inclusive. In December 2014, Bangladesh Bank released the compulsory guidelines under the name- "Guidelines on Risk Based Capital Adequacy (Revised Regulatory Capital Framework for banks in line with Basel III)". (BB, 2014)

5.3 Structure of BASEL III

To understand Basel III, we must first know the structure of the Basel III. It is illustrated in the figure (BIS, 2006) below:

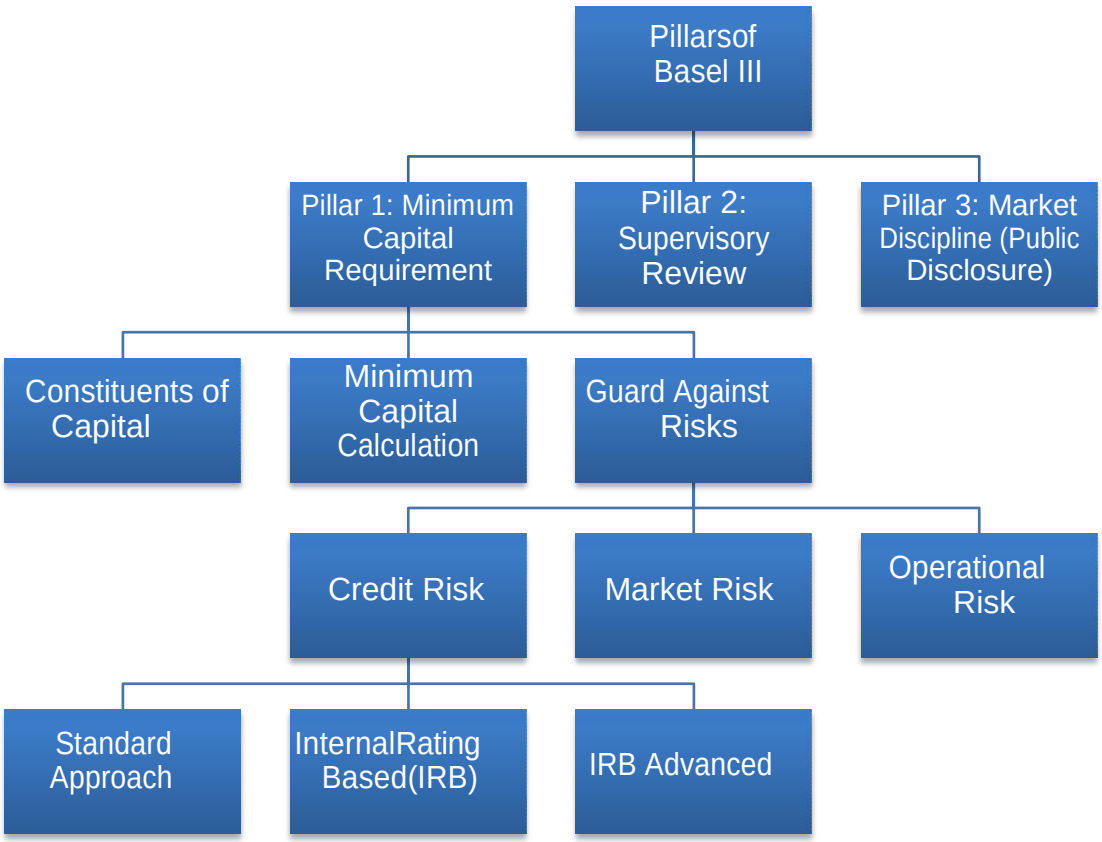

Figure 2: Basel III Structure

5.4 Guard against Three Risks

BCBS identified three basic risks that banks face and they think adequate capital should be there to guard the bank against these risks.

5.5 Credit Risk

Credit risk is the risk bank faces when its borrowers and/or counterparty do not fulfill their obligation towards the bank. Bank's claim will include loans and advances to and deposits in local and foreign currency to other banks, central bank and other local and international institution which include International Monetary Fund (IMF), World Bank, Asian Development Bank (ADB), European Central Bank (ECB) and etc. Assets in non-bank financial institutions (NBFIs), corporate, retail and SME will also have to be counted. The maximum exposure to single borrower (person or institute) can be BDT 1 crore (BB, 2010, pp.9)11.

5.6 Market Risk

Market risk arises from on and off balance sheet exposure to debt securities, equity securities and foreign currency. The main concern is that the variables will move adversely and the bank will incur losses due to the loss of value of the securities. BB requires banks to maintain capital for interest rate movements, adverse price movements of equity securities, foreign exchange, repo-reverse repo transactions, interest rate derivatives, Forward Rate Agreements (FRA) and SWAPs (BB, 2010, pp.32-34)12.

5.7 Operational Risk

This risk is the risk of loss due to failed internal process, people and system or from external events. It also includes legal risk.

5.8 Pillar 1: Minimum Capital Requirement

Basel Committee and BB agree that some minimum capital must be maintained to make banks and depository institutions more risk sensitive and shock resilient. BB laid out guidelines about the capital that can be and should be counted in calculating Capital Adequacy Ratio (CAR).

5.9 Risk Based Capital Adequacy

BB did not give banks any specific amount of capital target. Banks have different mix in their loans and advances portfolio. HSBC Bangladesh has huge corporate loan portfolio whereas RAKUB Limited focuses heavily on SME loans. A one size fit all capital amount would not have been right. This is why a bank is supposed to weight its assets according to the risk it faces and maintain adequate capital to protect itself. The assets are weighted with risk factors and Total Risk Weighted Asset (RWA) is found. Minimum 10% of the RWA must be backed by Total Eligible Capital (Tier 1, 2 and 3 capitals) (Ahmed, 2011)13 and minimum 5% of RWA must be backed by Core Capital (Tier 1 capital) (RAKUB, 2010).

5.10 Eligible Regulatory Capital

To measure capital base, regulators divided qualifying capital in three tiers. The tiers with their constituents (BB, 2010, pp.1-2)15 are shown in the table below:

Table 1: Capital Tiers and their constituents

Tier	Constituents
Tier 1: Core Capital	1. Paid up capital 2. Non-repayable share premium account 3. Statutory reserve 4. General reserve 5. Retained earnings 6. Minority interest in subsidiaries 7. Non-cumulative irredeemable preference shares 8. Dividend equalization account
Tier 2: Supplementary Capital	1. General provision (Unclassified loans, Special Mention Account loans and off Balance Sheet exposures) 2. Revaluationreservesforfixedassets,securitiesandequityinstruments 3. All other preference shares 4. Subordinated debt
Tier 3:Additional Supplementary Capital (for Market Riskonly)	1. Short term subordinated debt (2 years<= maturity<= 5 years)

There are conditions to maintain the capital for the purpose of protecting against risks:

- Tier 2 capitals cannot be more than Tier 1 capitals.
- Only 50% of Revaluation reserves for fixed assets and securities will be counted as Tier 2 capital.
- Only 10% of Revaluation reserves for equity securities will be counted as Tier 2 capital.
- Subordinated debt can be maximum 30% of Tier 1 capital to be considered in CAR calculation.
- Tier 1 capital must cover at least 28.5% of market risk. Supporting of Market Risk from Tier 3 capital must be limited to 250% of Tier 1 capital that remains after meeting credit risk capital requirement by Tier 1. (BB, 2010, pp.3)16

  Risk Weighted Assets (RWA)

Risk must be taken into consideration while calculating the capital needed to meet BB requirements. BB provides a list of assets and necessary weights based on their respective risk. The basic RWA calculation (RAKUB, 2020)17 is as below:

Table 2: Format for Risk Weighted Asset Calculation

	Risk Weighted Assets (RWA) for	**Amount**
A	**Credit Risk**	**XXXX**
	On- Balance sheet $\sum(Exposure\ types * Risk\ Weights)$	XXXX
	Off- Balancesheet $\sum(Exposure\ types * Risk\ Weights)$	XXXX
B	**Market Risk** (Capital charge for Market Risk * 10)**	**XXXX**
C	**Operational Risk** (Capitalcharge for Operational Risk*10)**	**XXXX**
Total RWA (A+B+C)		**XXXXX**

**Capital charge for market risk and operational risk are multiplied by 10(= reciprocal of minimum capital adequacy ratio of 10%)

Minimum Capital Requirement (MCR) is 10% of Total RWA. Thus, Capital Adequacy Ratio (CAR) should be:

$$CAR = \frac{Eligible\ Regulatory\ Capital}{RWA} \geq 10\%$$

The Balance Sheet items and their recommended weights for Credit Risk calculation can be found in a tabular form in Appendix 1.

Loans and Advances, investment and other asset portfolio exposure and their recommended risk weights for Credit Risk calculation can be found in Appendix 2.

Capital Charge calculation for Market Risk (RAKUB, 2020)18 is shown below: Table 3: Format for calculating Capital Charge for Market Risk

Table 3: Format for calculating Capital Charge for Market Risk

Details	Capital Charge for Specific Risk (Market Value *10%)	Capital Chargefor General Market Risk(Market Value *10%)	Total Capital Charge for Market Risk
	1	2	(1 +2)
Interest Rate Related instruments	XX	XX	XXXX
Equities	XX	XX	XXXX
Foreign Exchange Position	XX	XX	XXXX
Commodities	XX	XX	XXXX
Total			**XXXXX**

Banks in Bangladesh can compute Capital Charge for Operational Risk under Basic Indicator Approach (BIA) (BB, 2010, pp.126)19. The approach is summarized below:

Where,

K = Capital charge under BIA

GI = only positive annual gross income over the previous 3 years α = 15% (as per guideline)

n = number of previous three years for which gross income is positive

5.11 Gross Income (GI) Calculation:

	Total Profit/Loss before tax	XX
(+)	Total Provision	XX
(+)	Total Operating Expenses	XX
(-)	Realized profit/losses from sale of securities	XX
(-)	Extra ordinary/irregular items	XX
(-)	Income derived from insurance	XX
=	**Gross Income (GI)**	**XXXX**

5.12 Capital Adequacy Ratio (CAR)

Minimum Capital Requirement (MCR) is 10% of Total RWA. Thus, Capital Adequacy Ratio (CAR) should be:

$$CAR\ on\ actual\ \ eligible\ capital = \frac{Eligible\ Regulatory\ Capital\ (Tier\ 1,2,3)}{RWA} \geq 10\%$$

$$CAR\ on\ core\ capital = \frac{Eligible\ Core\ Capital\ (Tier\ 1\ capital)}{RWA} \geq 5\%$$

5.13 Credit Risk Mitigation (CRM)

Banks use a number of tools to reduce their risk exposure to protect their loan portfolio. The tools or techniques can be considered in two heads: 1. Collateral for CRM and 2. Guarantee for CRM.

Banks are allowed to reduce their risk of counter party default by being in possession of eligible financial collateral (BB, 2010, pp.19)20. Eligible financial collateral include:

- Cash (also Certificate of deposit, fixed deposit or comparable instrument)
- Gold

Securities rated by recognized External Credit Assessment Institution (ECAI) as investment grade.

- Debt securities not rated by ECAI but:
- Issued by a bank
- Listed on recognized exchange

- Classified as senior debt

Equities that are traded in Dhaka and Chittagong Stock Exchange (DSE and CSE).

Value will be calculated based on last six month's daily average.

The eligibility criteria of the collateral are also mentioned by BB (BB, 2010, pp.20)21:

- The bank should have the right to liquidate or take legal possession of it in a timely manner in the event of default or bankruptcy.
- There must not be a material positive correlation between counterparty and issuer of collateral.
- Banks must have clear and robust procedures for timely liquidation of collateral.
- If the collateral is held by a custodian, bank must take steps to ensure that custodian segregates the collateral from its own assets.

5.14 Eligible guarantors for CRM are:

- Sovereigns, sovereign entities and banks with a lower risk weight than the counterparty.
- Guarantee provided by parent, subsidiary and affiliate companies when they have lower risk weight than the counterparty.

There are conditions that must be met by eligible guarantors (BB, 2010, pp.22-23) 22:

- The guarantee must be clearly and explicitly referenced. It must be indisputable, irrevocable, and unconditional and should be obliged to pay back in timely manner in the event of default by the original party.
- When a guaranteed exposure is classified as nonperforming, the guarantee will no longer be considered as a risk mitigant.
- The bank should have the right to be paid by the guarantor, in case of default by the original party, without first taking legal steps against the original party.

5.15 Credit Risk Calculation Methodologies

Basel II allows three ways to calculate credit risk and any one can be followed. The first is the Standard Approach. It calls for the use of external credit rating by External Credit Assessment Institution (ECAI). The ECAI determined risk weights for counterparty will

be used in credit risk calculation. ECAIs will also determine similar counterparty groups and apply standard risk weightings to those categories. The second way is Internal Ratings Based (IRB) approach. This approach allows banks to use their internal assessment of counterparty regarding the Probability of Default but requires them to use standard supervisory parameters regarding Exposure at Default and Loss Given Default. The final approach is the IRB Advanced approach. This approach allows banks to use their own internal assessment in determining Probability of Default and quantifying Exposure at Default and Loss Given Default (RAKUB, 2020).

Pillar 2: Supervisory Review Process (SRP)

The main theme of Pillar 2 is that (1) banks have to have a process to assess their own risk profile and calculate adequate capital and (2) they must have a strategy to maintain the level of adequate capital required in the future. Banks should also have SRP team which will manage all the risks a bank faces, develop and implement better risk management techniques.

5.16 Effective Oversight by Management

The supervisory process is a tool for the regulators to ensure adequate capital of banks to guard against risks. It also delegates responsibility to top management of the institutions to make certain of the implementation of the laws. The management must analyze their risks internally, make plan on capital and maintain proper internal control process. Supervisory review process will address:

- Risk that are not covered by Pillar 1 (risks other than credit, market and operation)
- External risk factors to the bank that are not captured by Pillar 1.

Management must take steps to plan for achieving proper capital target and to gradually use advance process of calculating RWA and CAR. The five main features of effective review process are:

  - Board and senior management oversight
  - Sound capital assessment
  - Comprehensive assessment of risks
  - Monitoring and reporting

- Internal control review

The SRP team is responsible for making and applying Internal Capital Adequacy Assessment Process (ICAAP). The ICAAP is an important part of Pillar 2 because it helps the bank in risk measurement and capital planning process. It is basically an internally created guideline regarding risk assessment and reporting process to be followed when considering the amount and type of capital the bank should maintain to support its business.

5.17 Supervisory Review Evaluation Process (SREP)

BB Basel III implementation cell reviews each bank's supervisory review process. This cell evaluates the bank's SRP and then arranges dialogue/ discussion session with that bank's SRP team.

BB SREP team will analyze bank's review process. BB expects banks to operate above minimum capital standards. BB, through SREP, will intervene at an early stage if they feel that the bank would falter in meeting minimum capital requirement. The frequency of meeting will depend on bank's activities and the difference between capital requirement assessed by the bank and BB team. Usually, the SRP-SREP Dialogue takes place in BB once every year.

5.18 Stress Testing

Stress testing is a kind of sensitivity analysis or "what-if-analysis" for banks. The purpose of this test program is to find out how shock absorbent a bank is. Basically, the test calls for changing a single variable at a time and observing what the result bring to the bank's assets, profitability, liquidity and other measures. The variables are changed to test forward looking scenario a bank might face. This will measure the vulnerability and exposure to rare, exceptional but potential events.

The five different risk factors that are used in stress testing (BB, 2010, pp.52)24 are:

- Interest rate
- Forced sale value of collateral
- Non-performing loan (NPL)
- Share price
- Foreign exchange rate

Stress test on liquidity must be done separately. The three levels of shocks are: Minor (e.g. only 1% change in interest rate), Moderate (e.g. a 3% change in interest rate) and Major (e.g. 5% or more change in interest rate) (BB, 2010, pp.53) 25.

After BB collects information from banks and finishes the dialogue, the bank and BB will set the total capital requirement for the bank corresponding to the risks they face. The general format of additional capital (BB, 2011, pp.3)26 is given below:

Table 4: Additional Capital under Pillar 2

Particulars of risks against which capital required	**Required Capital**
Credit risk	XX
Market risk	XX
Operational risk	XX
A) Capital Requirement against Credit, Market & Operational risks	**XXXX**
Residual risk	XX
Evaluation of Core Risk management	XX
Credit concentration risk	XX
Interest rate risk in the banking book	XX
Liquidity risk	XX
Reputation risk	XX
Settlement risk	XX
Strategic risk	XX
Environmental & Climate change risk	XX
Other material risk	XX
B) Requirement of additional capital under SRP	**XXXX**
Total Capital Requirement (A+B) for the year	**XXXXX**

Risks that are assessed through capital and those that are not are shown below:

Risk assessed through capital	Risk not explicitly assessed through capital
Credit Risk	Liquidity Risk
Market Risk	Reputation Risk
Operational Risk	Sustainability Risk
Interest rate in the banking book	Concentration Risk
Pension risk	Strategic Risk

Pillar 3: Market Discipline

This pillar is present in Basel II framework to complement the other two pillars. This pillar requires the bank to disclose information to public and be more transparent to the financial market and the participants. Current and potential stockholders, depositors and borrowers will want to know the bank's strengths and potential loss of assets.

5.19 Disclosure Requirements

Banks must have a formal disclosure framework approved by the Board or CEO of the bank. The banks must follow the disclosure format provided by BB.

The disclosed information must be consistent to the audited financial statements. The information must be material and omission of important and relevant data must be avoided. Banks have to submit the data along with annual financial statements to BB by the end of March every year. Banks can disclose the Basel II information in their Annual Report and/or on their website. In case of Annual Report, a separate section must be utilized to report information. In case of website, the Basel II information must be provided in the home-page. The historical information must be maintained in the website for 4 years (BB, 2010, pp.59)27. The components must be disclosed in tabular form and in quantitative and/or in qualitative form regarding the topics mentioned below:
Scope of application

- Capital structure
- Capital adequacy
- Credit Risk
- Equities: disclosures for banking book positions

- Interest rate risk in the banking book (IRRBB)
- Market risk
- Operational risk

Basel III: Basic Proposition

Basel III is introduced in a situation when the global banking industry is in ruin. Thus, one may expect Basel III to be more rigorous in regulating and protecting the banks. It will move to fill in the deficiencies the banks have in their operation that are revealed by the latest global financial crisis. Banks will have to hold 4.5% of common equity in their capital. The MCR on core capital is going up to 6% from 5% of Basel II. Basel III also introduces additional capital buffers, minimum 3% leverage ratio and two liquidity ratios (the Liquidity Coverage ratio and Net Stable Funding ratio) (Wikipedia, 2011)28.

Basel III implementation in RAKUB

In RAKUB, the implementation works started in 2009 and in 2010, the bank fulfilled all the major requirements of BB. In 2011, the bank has met all reporting requirements set by the central bank.

5.20 Implementation Achievements

RAKUB has been successfully achieving the desired Capital Adequacy Ratio (CAR) since 2009. The management is fully aware about the guidelines of BB and prepared for implementing new Basel III accord. An implementation committee has been formed which is headed by the Head of Operations. Adequate training from home and abroad to the concerned staff on Basel II is given for better understanding and smooth implementation of Basel II. RAKUB Bank also issued BDT 3 billion worth of bond to meet its Tier 2 Capital (Subordinated 25% convertible bond). A table below shows historical (RAKUB, 2020,) 29 and current (RAKUB, 2011)30 CAR ratio of RAKUB.

(A) Capital structure

The amount of Tier 1 capital, with separate disclosure:	2018 (Taka In crore)	2019 (Taka In crore)	2020 (Taka In crore)
Paid up capital	824.80	824.80	824.80
Non-repayable share premium account	-	-	
Statutory reserve	-	-	-
General reserve	20.79	20.79	20.79
Retained earnings	-1056.65	-1100.46	-1715.22
Minority interest in subsidiaries	-		-
Non-cumulative irredeemable preference shares	-		-
Dividend equalization account	-		-
Total of Tier 1 Capital /CET-1	**-210.96**	**-254.87**	**-869.63**
The total amount of Tier 2 capital.	**37.59**	**41.88**	**52.94**
Shortfall in provisions required against classified assets	-	-	-
Total eligible capital.	**-173.37**	**-212.99**	**-816.69**

(B) Capital Adequacy

Description	2018 (Taka In crore)	2019 (Taka In crore)	2020 (Taka In crore)
Capital requirement for Credit Risk	434.27	488.91	488.91
Capital requirement for Market Risk	0.63	0.63	0.63
Capital requirement for Operational Risk	39.86	35.84	35.84
Total Minimum Capital Required (MCR) as per Basel III	474.76	525.38	525.38
Total and Tier 1 capital ratio:			
Capital to Risk weighted Asset (CRAR)	-3.65%	-15.54%	-15.54%

Tier 1 Capital to Risk Weighted Asset (RWA)	-4.44%	-16.55%	-16.55%

CAR	**Requirement Under Basel II**	**RAKUB 2018**	**RAKUB 2019**	**RAKUB 2020**
On core Capital Tier-1	5%	-3.65%	-15.54%	-15.54%
On Actual Capital Tier 1, 2, 3	10%	-4.44%	-16.55%	-16.55%

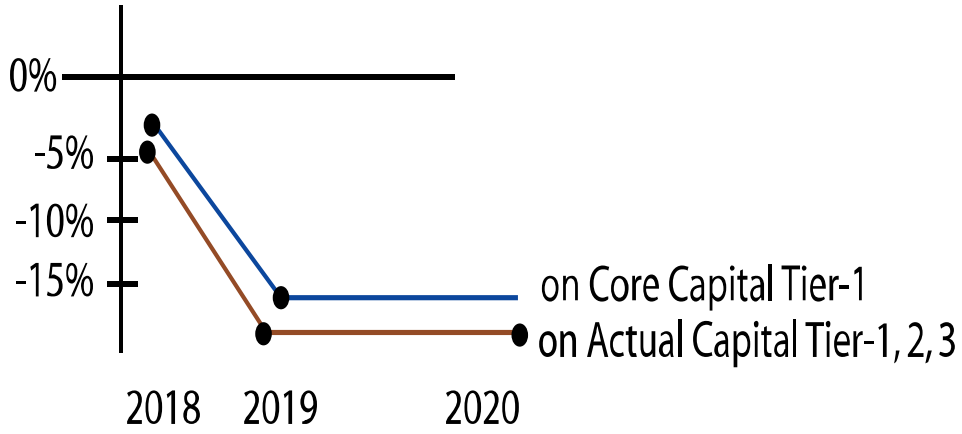

Figure 3: Yearly change CAR

Total Risk weighted Asset Has been Calculated

	Risk Weighted Asset (RWA)	2020 (TK in Crore)
A	Credit Risk	488.91
B	Market Risk	0.63
C	Operational Risk	35.84
Total RWA (A+B+C)		525.38

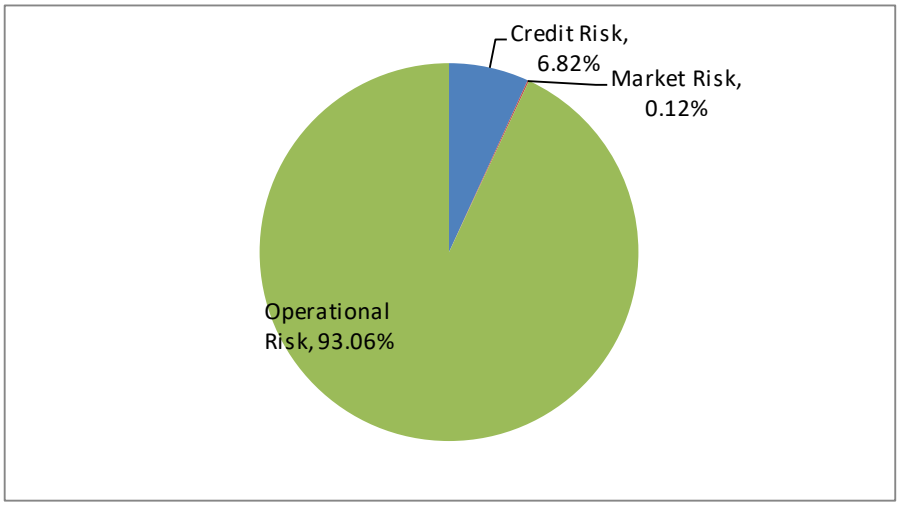

Figure 4: Risk Weighted Asset.

(C) Equities: Disclosures for banking Book position

Particulars	2018 (Taka in core)	2019 (Taka in core)	2020 (Taka in core)
Book Value	3.16	3.16	3.16
Market Value	1.55	1.26	0.89
Gain/Loss	1.61	1.90	2.27
Maintained provision for Loss	1.61	1.90	2.27

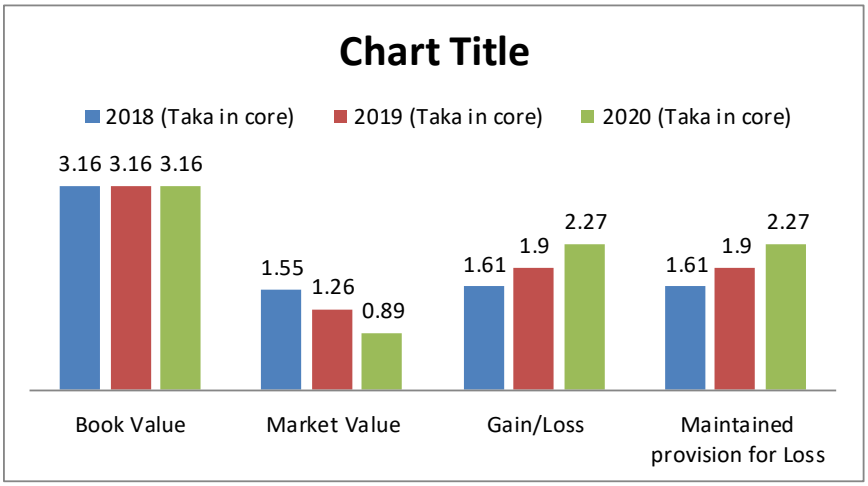

Figure 5: Equities: Disclosures for banking Book position

(D) Operational Risk:

	2018 (Taka in core)	2019 (Taka in core)	2020 (Taka in core)
The Capital Requirements for operational risk	39.86	40.39	35.84

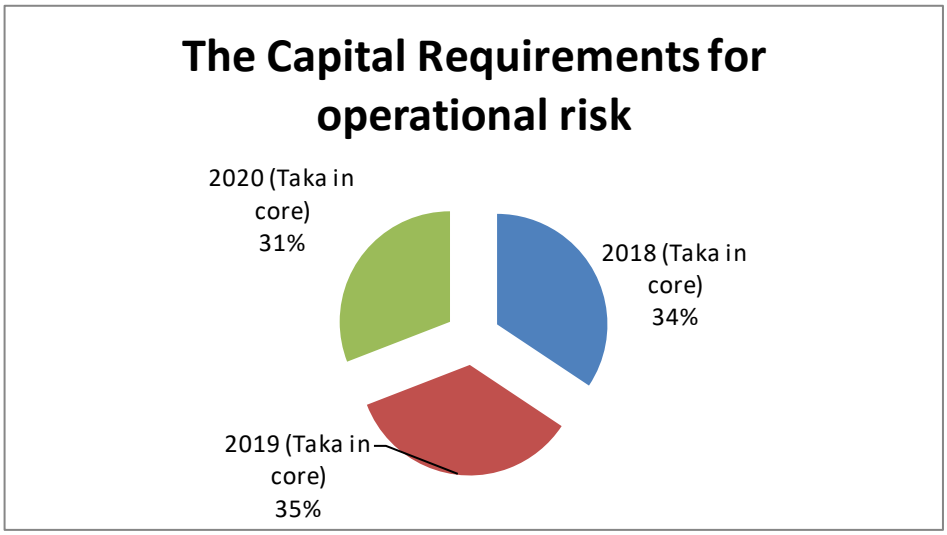

Figure 6: Operational Risk

(E) Liquidity Ratio

particulars	**2018**	**2019**	**2020**
Liquidity Coverage ratio	214%	531%	461%
Available amount of stable funding	1186.98 Crore TK	1211.17 Crore TK	1567.91 Crore TK
Required amount of stable funding	781.31 Crore TK	659.04 Crore TK	684.99 Crore TK

(F) Leverage ratio:

Particulars	**2018**	**2019**	**2020**
Leverage ration	3.02%	-3.44%	-12.16%
On balance sheet exposure	6993.49 Crore TK	7407.16 Crore TK	7153.98 Crore TK
Off balance sheet exposure	0.00	0.00	0.00
Total Exposure	6993.49	7407.16	7153.98

Chapter 6

Findings and Suggestions

6.1 Findings

After going through BB's "Guidelines on Risk Based Capital Adequacy (Revised Regulatory Capital Framework for banks in line with Basel III)", I realized it is a pretty complex set of instructions which rightfully demands a separate team in the bank for the implementation purpose. Without training, it is very difficult to grasp the global standard regulatory policy for the whole banking industry. After talking to one of the members of SRP team, I got to know Basel III better. Basel II became mandatory for all scheduled banks in Bangladesh since January 2010. It did not take long for the banks to adopt Pillar 1 of the policy. RAKUB Bank has been maintaining a little over the minimum CAR ratio. This year, 2011, is significant because RAKUB will submit full Basel report to BB with Pillar 2 requirements also. The problems in implementing the requirements in RAKUB should be mitigated as soon as possible for smooth adoption. Data should be centralized, a program or software should be in place to get the Basel reporting done and banks should be helped more by BB. There are three types of shocks- minor, moderate and major. A combined shock should be applied to see realistic result of the bank's sustainability rather than applying an extreme shock with keeping all other things constant. So stress test should be a "scenario analysis" rather than a "what if analysis". It will become very complex but very realistic than current stress test measure. I was pessimistic about the minimum 10% CAR on total capital at first, thinking it might not be enough to cover the major risks mentioned in Basel III. But 10% of RWA is a huge amount of money and will safeguard a bank.

- Total Eligible Capital 2018 -173.38 crore Tk, 2019-212.99 crore Tk, 2020-816.69 crore Tk
- Capital to Risk Weighted Assets (CRAR) 2018 -3.65%, 2019 - 15.54%, 2020-15.54%,
- Risk Weighted Assets (RWA) 2018 -4.44%, 2019 -16.55%, 2020 -16.55%

- Out Of the 11 banks, the capital shortfalls of six banks — BKB, ICB Islamic Bank, BASIC Bank, Bangladesh Commerce Bank, Padma Bank and AB Bank — have deteriorated.

- Capital shortfall of BASIC Bank increased by Tk 855.28 crore to Tk 1,927.2 crore from Tk 1,072 crore, ICB Islamic Bank's capital shortfall increased by Tk 11.49 crore to Tk 1,642.49 crore from Tk 1,631 crore, BCBL's shortfall increased by Tk 94.21 crore to Tk 1,146.21 crore from Tk 1,052 crore, Padma Bank's shortfall increased by Tk 79.49 crore to Tk 461.49 crore from Tk 382 crore and AB Bank's shortfall increased by Tk 227.52 crore to Tk 329.52 crore from Tk 102 crore.

- Of the remaining five banks, capital shortfall of Sonali stood at Tk 3,557.86 crore, that of Agrani at Tk 1,960.23 crore, RAKUB at Tk 1,506.4 crore, Rupali at Tk 664.94 crore and Janata at Tk 345.04 crore.

- Under Basel-III, the banks are instructed to maintain the minimum capital requirement (MCR) at 10 per cent of the risk weighted assets (RWA) or Tk 4 billion as capital, whichever is higher.

- Even after continuous issuance of regulatory forbearance since the coronavirus outbreak, non-performing loans in the country's banking sector increased by Tk 9,430.25 crore to Tk 98,164.31 crore as of June 30, 2021 from Tk 88,734.06 crore as of December 31, 2020.

- If the upward trend of non-performing loans continues, the banks which are suffering from capital shortfall and those maintaining capital adequacy barely would be faced with intense problems when the regulatory forbearances would be withdrawn.

6.2 Suggestions

- Low capital adequacy ratio is the direct consequence of the banks' default loans as the banks had to keep their provisioning against default loans, says former Finance Adviser to a Caretaker government AB Mirza Azizul Islam.

- According to the BB guidelines on risk-based capital adequacy, banks have to maintain a minimum capital adequacy ratio (CAR)—which is a bank's capital reserve to cover their risk exposure—of 12.50% by 2019, in line with the BASEL III requirement.

- Overall capital adequacy ratio (CAR) in the overall banking sector was not bad at all but the state- run banks and some new banks capital adequacy ratio was not good owing to their high amount of non-performing loans, says Zahid Hussain, former lead economist of the World Bank Bangladesh office.

- RAKUB Play a vital role in agricultural sector. Loan have to disburse properly.

Chapter 7

Conclusion, Policy Implications and Future Work

7.1 Conclusion

Based on the final regression model, since a bank follows a riskier investment portfolio for earnings, it generally faces a higher level of capital risk due to the increase in risk-weighted asset. The capital risk ratio, therefore, rationally decreases, which is followed by the capital adequacy ratio. Then, the commercial bank has incentives to raise equity or spend much more retained earnings on covering this risk to protect depositors' rights. The capital amount growth might make a contribution to invested capital as well as Tier 1 (Core) Capital, which are stipulated in the Circular 13 by SBV. Therefore, in capital risk controlling efforts, the commercial banks also strengthen their adequate capital level. In other word, the higher the degree of capital adequacy, the more safely banks might be able to deal with capital risk. Secondly, owner's equity risky assets ratio has illustrated to be statistically significant for level of adequate capital. This indicator pays much attention on function of owner equity towards depositors in case of bankruptcy. When the risks are considered to increase for some reasons, banks tend to adjust their risky project to a reasonable level, lowering the degree of capital adequacy. As a result, the increase in owner's equity risky assets ratio enhances the banks' capital adequacy ratio.

7.2 Policy Implications

RAKU Bcan involve them with agribusiness, so that it will help rural people as well as the branch can maintain capital adequacy policy effectively.

All people are the future of our country. They are the mostly user of technology. RAKUB should have plan for them. Have to offer special account for them. All technological and updated facilities will have there and have to create awareness among them.

7.3 Future Work

In term of future research opportunity, the research interests to specify and compare the different type of banks, which consist of former state-owned commercial banks, joint-stock commercial banks, joint-venture banks, and financial companies, in order to investigate whether type affects the decision of setting this capital level. Another direction for further research on this topic is to work on the simultaneous equation examines the relationship between risk and capital regulation.

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