A study on the impact of risk and competition on bank profitability in Bangladesh

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Abstract Born in 1971, Bangladesh witnessed a phenomenal growth in banking industry since the liberalization policy was introduced in 1980s. Before the liberalization policy, there were only four domestic banks (Sonali Bank, Pubali Bank, Rupali Bank, and Janata Bank) in Bangladesh and they were nationalized. There were only three foreign banks. However, there was no private bank. As a result, there was no competition in the banking industry of Bangladesh. The banking market was highly concentrated and dominated by four nationalized banks. The profitability of banks was highly unsatisfactory due to risk and competition. Still banking industries are facing those types of risk and competition for generating profit. As much as possible we are trying to find out sort of risk and competition of bank in Bangladesh. Bank lending rates were taken as a proxy for interest rate while Return on Assets (ROA) and Return on equity (ROE) were taken as a profitability of the banks. The failure model was used in the study to witness the effects of interest rate on profitability. The results show that the interest rate has more effects on both ROA and ROE in private banks as compared to the public sector banks. We introduce a new perspective to systematically investigate the cause-and-effect relationships among competition, innovation, risk-taking, and profitability in the Bangladesh banking industry. Our hypothesis are tested by the structural equation modeling (SEM), and the empirical results show that (i) risk-taking is positively related to profitability; (ii) innovation positively affects both risk-taking and profitability, and the effect of innovation on profitability works both directly and indirectly; (iii) competition negatively affects risk-taking but positively affects both innovation and profitability, and the effects of competition on risk-taking and profitability work both directly and indirectly; (iv) there is a cascading relationship among market competition and bank innovation, risk-taking, and profitability.

Keywords: Banks, Risk analysis, competition, profitability, hypothesis.

1. INTRODUCTION

This Research paper try to assess bank performance, competition and their relationship empirically by using banking sector data and individual bank data from Bangladesh. That why...
we take some on the bank in Bangladesh to find out the Return on assets and data envelopment analysis grounded bank efficiency are used as bank performance measures, whereas eight structural measures are employed for assessing competition followed by the adoption of regression analysis for identifying its impact. The findings research an improvement of bank performance with a few fluctuations in between the sample periods under study. On the other hand, the level of competition has been consistently increasing in the banking sector, as pointed out by all structural measures and the profitability is ups and down year by year. The regression result shows evidence of a negative relationship between competition and bank performance. It is required to revisit the structural changes of the banking sector. In particular, the regulatory authorities need to ensure necessary incentives for banks, particularly for private banks, to improve their performance in terms of profitability and efficiency. Concerning the banking sector of Bangladesh, the objective of accelerating competition and banking sector performance has been accomplished by the government by adopting different policies including introduction of private sector banks in 1982, initiation of denationalizing state-owned banks in 1983, and declaration of Financial Sector Reform Program (FSRP) for deregulating the banking sector in 1989 by introducing relaxation of reserve requirements, withdrawal of state directed credit policy, development of legal infrastructure, adoption of international standard for loan screening and monitoring, and liberalization of deposit and lending rates (Debnath, 2004). The policy initiative undertaken by the government during 2000 for merging or closing down of unproductive branches of state-owned banks played significant role in creating level playing ground for the private and foreign banks that emerged into the market during the liberalization framework.

2. PROBLEM STATEMENTS:
Identifying the impact of risk and competition among 3 banks in Bangladesh to find out their risk analysis competition and profitability on based on the Banking financial year.

➢ Aim

The aim of the research is to find out the bank’s profitability by executing impact of risk and competition among the Banks of Bangladesh.

➢ Objectives

The objective of the research is identifying and analyzing the impact of risk with the competition among the banks and to find out the profitability of those banks in Bangladesh.
Individual objective

To identify the risk of Banks
To find out the impact of risk of the banks
To execute the competition among the banks
To find out the bank’s profitability among the bank in Bangladesh.

3. DEFINITION OF TERMS

Impact of risk: Once you have identified the risks to your financial institution, you need to assess the possible impact of those risks. You need to separate minor risks that may be acceptable from major risks that must be managed immediately.

Competition of Bank: The global financial crisis reignited the interest of policy makers and academics in bank competition and the role of the state in competition policies (that is, policies and laws that affect the extent to which banks compete). Some believe that increases in competition and financial innovation in markets such as subprime lending contributed to the financial turmoil. Others worry that the crisis and government support of the largest banks increased banking concentration, reducing competition and access to finance, and potentially contributing to future instability as a result of moral hazard problems associated with too-big-to-fail institutions.

Bank Profitability: Like all businesses, banks profit by earning more money than what they pay in expenses. The major portion of a bank’s profit comes from the fees that it charges for its services and the interest that it earns on its assets. Its major expense is the interest paid on its liabilities. The major assets of a bank are its loans to individuals, businesses, and other organizations and the securities that it holds, while its major liabilities are its deposits and the money that it borrows, either from other banks or by selling commercial paper in the money market.

4. REVIEW OF THE RELATED LITERATURE:

The banking literature remains divided over the conflicts arising out of the SCP paradigm, also known as the structure performance paradigm, and the ES paradigm. The SCP hypothesis, which, according to Park (2009, p.654) and Seelanatha (2010, p.21), dates back to Mason (1939), is the oldest and traditional hypothesis. It states that the performance of banks largely depends upon the structure of the market such as the number of banks and the market shares of banks; and the profitability of banks decreases with the increase of competition. In other words, the higher
the concentration ratio, the higher will be the profitability of banks, reflecting a positive association between market share of a bank and its performance.

In Bangladesh, many scholars argue in the opposite direction to support the competitive market structure. Calem and Carlino (1991) point out that a market with higher concentration is more vulnerable to crisis; and thereby is less competent and equitable. Berger et al. (2004) mention that government intention to restrict competition through foreign bank entry regulation and state ownership of banks generates adverse effect and ultimate poor economic efficiency in a country. Furthermore, it is highly likely that banks in a concentrated atmosphere can engage in non-competitive deeds to generate higher revenue with lower benefits for consumers (Abbasogluet al., 2007; Wong et al., 2008); thus, produce monopoly and corresponding inefficiencies (Suzuki et al., 2008). Importantly, arguments highlighting the possible benefits of competitive market actually emerge from the application of the standard industrial organization economics to the financial sector, particularly the banking sector. Moreover, these arguments show their inclination towards the alternative hypothesis of the SCP, that is, the ES which states that enhanced performance of banks leads to higher market share which in turn results into market concentration associated with superior efficiency. That is, bank-specific efficiency difference in a particular market leads to uneven proportion of market size and corresponding high intensity of concentration. In fact, this hypothesis does not consider market concentration as a random event; instead, it is the result of greater efficiency of the dominant banks (Smirlock, 1985). This is possible because a bank with either superior management or production technology in a competitive market can lower cost to increase profit and to attain higher market share (Berger, 1995). On the other hand, a bank with higher efficiency than its competitors can also maximise profit either by maintaining the current market size and pricing policies or by accommodating size expansion and price reduction strategies (Lloyd-Williams et al., 1994, p.437). It means that banks under such a market mechanism strive for achieving dual objectives of maximizing profits and minimizing costs and prices, and as a consequence, the highest amount of credit will be allocated (Northcott, 2004). Therefore, according to the ES hypothesis, profitability of banks greatly depends upon the efficiency rather than the market structure of the banking sector. In this way, the emergence of the ES not only challenges the traditional SCP hypothesis but also puts
forward an alternative way of analyzing the different dynamics of the banking sector. Studies of Demsetz (1973), Brozen (1982), Samad (2008) and Seelanatha (2010) support the ES hypothesis.

Therefore, based on the literature reviewed above, it can be argued that the nature of the relationship between competition and bank performance is rather ambiguous. According to Wanniarachchige and Suzuki (2010), the relationship is country-specific in nature and as such they suggest to conduct more studies at country level. Focusing on the findings of earlier studies, concentrating on the banking sector of Bangladesh such as Samad (2008), the impact of competition on bank performance in the form of profitability and efficiency cannot be generalized since the results derived from pool and annual data portray different results. Because of this anomaly, he urges for further studies to explore the impact of changing market structure on bank performance.

With regard to the development of models for assessing the impact of competition, previous studies concentrating on developing countries adopt bank-specific, industry/country-specific, or a combination of both types of variables. For instance, Wanniarachchige and Suzuki (2010) use industry/country-specific variables only, whereas Ataullah and Le (2006) and Samad (2008) use both variables for their studies. This study also adopts similar approaches for selecting the necessary variables in the regression.

4.1 COMPETITION AND PROFITABILITY

The structure-conduct-performance (SCP) hypothesis from traditional industrial organization theory states that a firm’s performance is determined by its business strategy which is influenced by industry structure [3]. Furthermore, the SCP hypothesis posits that because of collusion and domination, firms earn higher profits in a concentrated market than in a competitive market. In other words, there is a positive relationship between market concentration and firm profitability [4]. With respect to the banking industry, existing literature provides lots of empirical supports for the SCP hypothesis. Bhatti and Hussain test the SCP hypothesis in the context of Pakistan’s banking industry and their result supports the SCP hypothesis [5]. Kamau and were investigate the driving factors of bank performance in Kenya during 1997–2011 and find that the source of superior performance is structure/collusive power [6]. Uddin and Suzuki empirically assess a negative relationship between competition and profitability by using banking sector data from
Bangladesh [7]. Tan and Floors investigate the relationship among market concentration, profitability, and risk-taking in the Chinese banking industry during the period from 2003 to 2009 and testify a negative relationship between competition and profitability [8].

4.2 COMPETITION AND RISK-TAKING
A standard view of banking supervision is that competition is detrimental to bank stability. On the one hand, competition erodes a bank’s franchise value which is equivalent to the cost of bankruptcy and encourages bank to pursue risky policies, such as lowering capital levels and softening the terms of loans, which increase nonperforming loans and result in credit risk [9]. On the other hand, a bank will select safe policies, which contribute to the stability of the entire banking system, to protect its franchise value when the market competition is restrained [10]. Another view argues that banks’ policies influence the behavior of borrowers, which in turn change bank risk-taking [11]. Specifically, restrained competition results in a high borrowing cost (i.e., interest rates being charged on loans), which possibly raise the credit risk of borrowers due to moral hazard issues [12]. For example, because of the information asymmetries in the credit business, borrowers can conceal their credit condition and payback ability, while banks are always at a disadvantage with respect to acquiring sufficient borrower information. Martinez-Miera and Repullo propose a model to illustrate the effect of competition on bank risk-taking and find that two effects working in opposite directions generate an unclear net effect on risk-taking and that the intensities of these two effects vary with the level of competition [13].

4.3 COMPETITION AND INNOVATION
The relationship between market competition and innovation is a primary focus of industrial organization theory. Schumpeter first states that market competition discourages innovation by diminishing monopoly rents and large firms are able to afford more capital for innovation activities [14]. On the contrary, some researchers assert that the Schumpeter hypothesis is not comprehensive and that there are more incentive factors in a competitive market than in a monopoly market [15]. Increased competition encourages innovation activities because firms in a competitive market attempt to escape competition and obtain monopoly profits [16]. Against al. propose a theoretical model and confirm that two effects vary with competition and produce opposing results; thus the net effect of competition on innovation is unclear [17].
4.4 INNOVATION AND PROFITABILITY
The efficiency hypothesis (EH) posits that the bank profitability depends on the bank’s degree of efficiency, whereas the bank’s degree of efficiency is affected by its financial innovation activities [18]. That is to say, innovation improves bank technology, which then increases bank efficiency and enhances bank profitability. Moreover, Allen et al. find that improving a bank’s technology enhances its quality of assets [19]. In addition, financial innovation generates new forms of bank products, such as Internet banking, mobile banking, telephone banking, ATMs, and POS networks, which provide relative high returns and low cost advantages that enhance bank profitability [20–22].

4.5 INNOVATION AND RISK-TAKING
Chen states that a bank’s innovation activities improve the efficiency of the screening and monitoring borrowers and eventually reduce the quantity of nonperforming loans and the bank’s credit risk [23]. Schaeck and Cihák propose that great efficiency will translate into reduced likelihood of bank default and enhanced stability [24]. However, Norden et al. claim that whether innovation is beneficial or not depends on why and how it is used by banks [25]. If innovation is employed to improve risk measurement and control, such as the screening and monitoring borrowers, it contributes to bank stability. However, if the innovation supported by banks is mainly for the purpose of achieving high profits, it encourages banks’ risk-taking behaviors and leads to bank failure. Hou et al. find a positive relationship between technical efficiency and risk-taking behaviors of Chinese commercial banks [26].

4.6 RISK-TAKING AND PROFITABILITY
The capital asset pricing model (CAPM) provides the first coherent framework for interpreting how the risk of an investment affects its expected return and depicts that the expected return is calculated by adding the risk free interest rate to the product of the investment’s beta and the expected market risk premium [27]. The investment’s beta is always positive; thus there is a positive relationship between market risk and expected return. A commercial bank must manage its assets through investments, and, in this sense, the bank can be perceived as an investor. Given that the risk appetites of bank managers determine the level of bank risk-taking, if most of a
bank’s managers are risk seekers, they will be willing to make risky decisions to obtain high returns. In other words, there is a positive relationship between bank risk-taking and profitability [28].

5. METHODOLOGY
5.1 Research Design:

The methodology adopted involved the conduct of interviews, preparation of questionnaires and their administration. The research used mix methods, incorporating both qualitative and quantitative data gathering methods. Qualitative research because it is based on holistic approach to science and is explained in terms of variables and units of analysis. Both explanatory research and descriptive research were used in accomplishing the objectives of the study. The explanatory research was again used to gain insight into the impact Risk and profitability in banking sector of Bangladesh.

5.2 Sources of Data:

In order to prepare a comprehensive and authentic research the author used both primary and secondary sources of data.

• Primary Sources of Data although the project is primarily based on primary sources of information, the only such source of information for this research are gathered from the bank.

• Secondary Sources of Data The secondary sources of information include the materials like different publication, report, and articles given to the author to understand different bank in Bangladesh.

5.3 Secondary Data:

Secondary data is the data that have been already collected by and readily available from other sources. Such data are cheaper and more quickly obtainable than the primary data and also may be available when primary data cannot be obtained at all. This data refers to data that has been collected previously for the purpose of other studies in the past by researchers. Evaluation of
secondary data is more about critically analyzing work which has already been carried out and finding the scope of more research opportunities. To ensure validity and reliability of the data, proper scrutiny has been carried out over a period of time. Critical review of literature in chapter two has been conducted through analysis of peer-reviewed articles from various sources. All analysis given previously includes secondary data which has been accessed through internet sources and other databases from different websites. If the time or hassle of collecting the own data is too much, or the data collection has already been done, secondary data may be more appropriate for any research. This type of data typically comes from other studies done by other institutions or organizations. In this research report, the secondary sources have been used like the internet websites, journals, and other research reports to collect the required data.

5.4 Primary Data:

Primary data process of the research can either be done by the researcher or can be outsourced to the person or organization which specializes in this type of survey. Although this type of exercise may be lengthy and costly for gathering the information, the researcher has tried to collect and use this data. This data research is not carried out frequently and organizations generally depend of secondary sources for information. In order to go for this process, the researcher has to take care of everything, starting from designing questionnaires, collecting replies from respondents and then interpreting it depending on requirements. This research is carried out after getting some knowledge from the secondary sources (e.g. Govt. surveys or surveys by other companies). One can decide to go for primary data research if he/she feels that the data available from secondary sources is not fulfilling the requirements. Primary market research can be quantitative or qualitative in nature.

5.5 Data Collection Methods:

In this research, the approaches are mainly categorized into two distinct methods, namely qualitative and quantitative approaches. Both methods are described elaborately in the following section and selected method and approach chosen for the dissertation is subsequently given. Qualitative and quantitative methods of data collection employ different techniques which characterize the differences between the two. Qualitative research report’s data collection concerns more of the attitudes, behavior and the responses from the selected population. On the
other hand, quantitative method of data collection is more aggressive where the researcher is required to employ resources for gathering data through different methods of surveys, interviews etc. This was done with the view to ensuring among other things that copies of the questionnaire reach all the respondents, that adequate and effective report could be established to encourage the respondents to accept and answer the questionnaire faithfully and that all copies of the questionnaire are appropriately answered and retrieved from all the respondents. The researcher did the administration of the questionnaires to customers.

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<tr>
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<th>Strengths</th>
<th>Weaknesses</th>
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<td><strong>Qualitative research</strong></td>
<td>Flexibility.</td>
<td>Lack of validity</td>
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<td></td>
<td>Sharing of experiences and feelings of participants.</td>
<td>Subjective and impressionistic.</td>
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<td>Sample size is smaller</td>
<td>Not Generalized</td>
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<td>More explanatory and rich in information.</td>
<td>Difficult to make comparison.</td>
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<td></td>
<td>Participants are free to express their feelings</td>
<td>Dependent on researchers input.</td>
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<tr>
<td><strong>Quantitative Research</strong></td>
<td>Data is scientific</td>
<td>Costly</td>
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<td></td>
<td>Generalized</td>
<td>Time Consuming</td>
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<td></td>
<td>Clear presentation of the data collected.</td>
<td>Often carried out in an unnatural environment</td>
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<td>Population is relatively large.</td>
<td>Structural bias and false representation of the research questions.</td>
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<td>Minimum personal biasness.</td>
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<td></td>
<td>Great objectivity and accuracy of results.</td>
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6. HYPOTHESIS DEVELOPMENT:

Null hypothesis (H0): Competition has not a negative relationship with bank profitability in the Bangladesh banking industry.

Alternative Hypothesis (Ha): Competition has a negative relationship with bank profitability in the Bangladesh banking industry.

Null hypothesis (H0): Competition has not a negative relationship with bank risk-taking in the Bangladesh banking industry.
Alternative Hypothesis (Ha): Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.

Null hypothesis (H0): Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.

Alternative Hypothesis (Ha): Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.

Null Hypothesis (Ho): Risk-taking has not a positive relationship with bank profitability in the Bangladesh banking industry.

Alternative Hypothesis (Ha): Risk-taking has a positive relationship with bank profitability in the Bangladesh banking industry.

Null Hypothesis (Ho): There is not a cascading relationship among market competition and bank innovation, risk-taking, profitability.

Alternative Hypothesis (Ha): There is a cascading relationship among market competition and bank innovation, risk-taking, profitability.

6.1 Scope of the Study:
This study focuses on some problems like financial, choice, demand and other. That is created by the lacking of the companies such as, design, models etc. The objective of this research is to analyze and identify the customer needs, choices demands and ability to purchases. Besides, the scope of the study is limited for the further research. The limitations of the study are discussed in chapter three of this research paper.

7. OVERVIEW OF THE BANKING SECTOR OF BANGLADESH
In spite of the existence of different forms of financial institutions and intermediation, the banking sector dominates the process of channelization of funds in Bangladesh. The size of banking sector assets relative to Gross Domestic Product (GDP) was 69.76% in 2010 compared to the size of market capitalization of the stock market relative to GDP of 32.79% and the size of non-banking sector assets relative to GDP of 5.98% (Bangladesh Bank, 2011; Uddin and Gupta, 2012). By the end of 2011, the banking sector composed of 47 scheduled banks out of which four
were state-owned banks, four were state-owned development financial institutions, 30 were private banks, and nine were foreign banks (Bangladesh Bank, 2011). Private Banks are subdivided into denationalized banks, Islamic banks and non-Islamic banks, and there were two denationalized banks, seven full-fledged Islamic banks and 21 non-Islamic banks. However, out of the 21 non-Islamic banks, 16 maintained separate Islamic banking windows for their customers leading to a total of 23 banks that engaged in the Islamic banking activities either partly or fully. The adoption of financial deregulation policies for accelerating the number of banks and branches under private and foreign ownerships results into a shift of market share from state-owned scheduled banks to private and foreign banks. For instance, in 1976, state-owned scheduled banks controlled 94.5% of deposits whereas by the end of 2011 the share became 32.1%. The share of private and foreign banks, in contrast, has been in an increasing trend. To be specific, the share of private banks has increased from 3.6% in 1983 to 61.6% in 2011 and the share of foreign banks has increased by 14.5% during 1976–2011. Similar changes can also be observed in the credit market. The permission issued by Bangladesh Bank for the inception of nine New private banks in 2012 accelerates the share of private banks further in future.

1. RISK ANALYSIS PART

1.1 Risk Assessment of united commercial bank limited:

CREDIT RISK:

![Graph showing the ratio of Provision for Loan Losses to Total Loans from 2011 to 2015](chart.png)
**Interpretation:** A credit risk is the risk of default on a debt that may arise from a borrower failing to make required payments. Loan loss provision is an expense set aside as an allowance for uncollected loans and loan payments. In 2011, the ratio of provision for loan losses to total loan is decreased 0.0064 and 2012 is 0.0137 slightly increased. Again, in 2013 is decreased 0.0079 and 2014 it will be increased 0.0103. And last we saw that, in 2015 is decreased in 0.0055 so we find out that the high significant of credit risk in 2012.

**LIQUIDITY RISK**

**Interpretation:** Cash equivalents are investments securities that are for short-term investing, and they have high credit quality and are highly liquid. In 2011 and 2012 it will be 0.1739 and 0.1827. But in 2013 and 2014 it slightly increased 0.2058 and 0.2201. At last 2015 again it decreased. So in this case 2014 lead to most significant of liquidity risk.
MARKET RISK

**Interpretation:** Market risk is the possibility for an investor to experience losses due to factors that affect the overall performance of the financial markets in which he is involved. In 2011 the ratio of Book-Value of Assets to Market Value of Assets is 1.00. And rest of the year 2012, 2013, 2014 and 2015 is same.

INTEREST RISK

**Interpretation:** *Interest sensitive assets* are assets held by a bank that are vulnerable to changes in *interest rates*. *Interest sensitive liabilities* make up a significant *amount* of the *assets* of most banks. In 2011 the ratio of Interest Sensitive Assets to Interest Sensitive Liabilities is 0.8925. But in 2012 it is decreased by 0.8625.so interest risk of UCB bank is decreasing promptly.
1.2 RISK ASSESSMENT OF AB BANK LTD.

CREDIT RISK

The ratio of Provision for Loan Losses to Total Loans

![Chart showing the ratio of Provision for Loan Losses to Total Loans from 2011 to 2015.]

**Interpretation:** Loan loss provision is an expense set aside as an allowance for uncollected loans and loan payments. In 2011 the ratio of Provision for Loan Losses to Total Loans is 0.0134 or 1.34%. Then it is decreased in 2012 to 0.0098. Then it is increased for two years and again decreased to the last year. So it is show that in 2014 credit risk of AB bank is most significant.

LIQUIDITY RISK

The Ratio of Cash and Government Securities to Total Assets

![Chart showing the ratio of Cash and Government Securities to Total Assets from 2011 to 2015.]

**Interpretation:** Cash equivalents are investments securities that are for short-term investing, and they have high credit quality and are highly liquid. In 2011 0.1650 or 16.50% but in 2012 it is increased to 0.1980 or 19.80% and 2013, 2014 slightly decreased. But 2015 it is again increased. So in this case we understand that in 2012 the liquidity risk of AB bank was most significant.
MARKET RISK

**The ratio of Book-Value of Assets to Market Value of Assets**

*Interpretation:* Market risk is the possibility for an investor to experience losses due to factors that affect the overall performance of the financial markets in which he is involved. In 2011 the ratio of Book-Value of Assets to Market Value of Assets is 1.00, and rest of the year 2012, 2013, 2014 and 2015 is same.

INTEREST RISK

**The ratio of Interest Sensitive Assets to Interest Sensitive Liabilities**

*Interpretation:* Interest sensitive assets are assets held by a bank that are vulnerable to changes in interest rates. Interest sensitive liabilities make up a significant amount of the assets of most banks. In 2011 the ratio of Interest Sensitive Assets to Interest Sensitive Liabilities is 0.4531 or 45.31%. It is increased to 2012 that is 0.8666 or 86.66%, and 2014, 2015 it is gradually increased.

1.3 RISK ASSESSMENT OF UTTARA BANK LIMITED:
CREDIT RISK

Interpretation: A credit risk is the risk of default on a debt that may arise from a borrower failing to make required payments. Loan loss provision is an expense set aside as an allowance for uncollected loans and loan payments. In 2011, the ratio of provision for loan losses to total loan is decreased 0.0020 and 2012 is 0.0232 slightly increased. Again, in 2013 is decreased 0.0135 and 2014 and 2015 it is increased to 0.0240 and 0.0345. so in 2015 credit risk of Uttara bank is most significant and it is increasing year by year.

LIQUIDITY RISK
**Interpretation:** Cash equivalents are investments securities that are for short-term investing, and they have high credit quality and are highly liquid. In 2012 and 2013 it will be increased by 0.4071 and 0.4041. but in 2011, and 2014 and 2015 it is decreased to 0.3032, 0.3775 and 0.3479. so in 2012 lead to high liquidity risk.

INTEREST RISKS

![The ratio of Interest Sensitive Assets to Interest Sensitive Liabilities](image)

**Interpretation:** Interest sensitive assets are *assets* held by a bank that are vulnerable to changes in interest rates. Interest sensitive liabilities make up a significant amount of the *assets* of most banks. In 2011 the ratio of Interest Sensitive Assets to Interest Sensitive Liabilities is 1.067. It is increased to 2012 that is 1.104, and 2013, 2015 it is gradually decreased. But in 2014 it will slightly increase.

MARKET RISK

![The ratio of Book-Value of Assets to Market Value of Assets](image)
**Interpretation:** Market risk is the possibility for an investor to experience losses due to factors that affect the overall performance of the financial markets in which he is involved. In 2011 the ratio of Book-Value of Assets to Market Value of Assets 1.00 and rest of the year 2012, 2013, 2014 and 2015 is same.

2. AVERAGE CALCULATION:

Risk Measurement of whole Banking sector in Bangladesh with the analysis of AB Bank, UCB Bank, Uttara Bank:

2.1 Credit Risk

The ratio of Provision for Loan Losses to Total Loans

![Graph of Provision for Loan Losses to Total Loans](image)

**Interpretation:** The risk that promised cash flows from loans and securities held by Financial Institutions may not be paid in full. In 2011 credit risk was 0.0073 or .73 percent, In 2012 credit risk was increased to .0155 or 1.5 percent, In 2013 credit was slightly decreased to .0122 or 1.22 percent, In 2014 credit risk highly increased to .0167 or 1.67 percent and In 2015 the risk was constantly same.so we have found out that in 2014 and 2015 the high significant of credit risk faced by banking sector in Bangladesh.so the risk is gradually increasing day after day and it may high negative impact on Bank in Bangladesh.so in this case bank will not appreciate to approve the loan if it is not possible to minimize the credit risk.

2.2 LIQUIDITY RISK:

The Ratio of Cash and Government Securities to Total Assets
Interpretation: The risk that a sudden surge in liability withdrawals may require an Financial Institution to liquidate assets in a very short period of time and at less than fair market prices. In 2011 liquidity risk was 0.2140 or .21.4 percent, In 2012 liquidity risk was increased to 0.2626 or 26.26 percent, In 2013 liquidity was slightly decreased to 0.2569 or 25.69 percent, In 2014 liquidity risk slightly decreased to 0.2501 or 25.01 percent and In 2015 the risk was decreased to 0.2337 or 23.37 percent. so we have found out that in 2012 high significant of liquidity risk faced by banking sector in Bangladesh. The Banks might not follow the central Bank policies that’s why the banks have to face this risk.

2.3 MARKET RISK:

The ratio of Book-Value of Assets to Market Value of Assets
**Interpretation:** The risk incurred from assets and liabilities in a Financial Institution’s trading book due to changes in interest rates, exchange rates, and other prices.

### 2.4 INTEREST RATE RISKS:

The ratio of Interest Sensitive Assets to Interest Sensitive Liabilities

![The ratio of Interest Sensitive Assets to Interest Sensitive Liabilities](image)

**Interpretation:** The risk incurred by Financial Institution when the maturities of its assets and liabilities are mismatched. In 2011 interest rate risk was 0.8042 or .80.42 percent, In 2012 interest rate risk was increased to 0.9445 or 94.45 percent, In 2013 interest rate risk was highly increased to 0.9963 or 99.63 percent, In 2014 interest rate risk slightly decreased to 0.9707 or 97.07 percent and In 2015 the risk was decreased to 0.9417 or 94.17 percent. so we have found out that in 2013 high significant of interest rate risk faced by banking sector in Bangladesh.

### 3. PROFITABILITY ANALYSIS

#### 3.1 Profitability Analysis of AB Bank:

**Return on Assets**

<table>
<thead>
<tr>
<th>Year</th>
<th>Formula</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>Return on Asset: Net income / Total Asset</td>
<td>1,461,809,025 / 175,517,312,012</td>
</tr>
<tr>
<td>2012</td>
<td>= .0083 or .83%</td>
<td>1,390,385,050 / 154,404,751,243</td>
</tr>
<tr>
<td>2013</td>
<td>= .0091 or .91%</td>
<td>2013=Return on Asset: Net income / Total Asset</td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td>1,098,442,107 / 209,748,770,670</td>
</tr>
</tbody>
</table>
2014=Return on Asset: Net income / Total Asset
1,501,582,377 / 256,814,537,089
= .0058 or .58%

2015=Return on Asset: Net income / Total Asset
1,457,312,361 / 256,814,537,089
= .0056 or .56%

Return on Equity

2011=Return on Equity: Net income / Equity
1,390,385,050 / 15,015,433,185
= .092 or 9.2%

2012=Return on Equity: Net income / Equity
1,461,809,025 / 16,222,502,086
= .09 or 9%

2013=Return on Equity: Net income / Equity
1,098,442,107 / 17,308,687,827
= .063 or 6.3%

2014=Return on Equity: Net income / Equity
1,501,582,377 / 18,759,103,870
= .08 or 8%

2015=Return on Equity: Net income / Equity
1,457,312,361 / 23,575,987,130
= .062 or 6.2%

Profit Margin

2011=Profit Margin: Net income / Sale
1,390,385,050 / 8,665,997,427
= .16 or 16%

2012= Profit Margin: Net income / Sale
1,461,809,025 / 9,018,446,528
= .1620 or 16.2%

2013= Profit Margin: Net income / Sale
1,098,442,107 / 10,121,791,365
= .1085 or 10.85%

2014= Profit Margin: Net income / Sale
1,501,582,377 / 12,778,337,269
= .1175 or 11.75%
3.2 PROFITABILITY ANALYSIS OF UCB BANK:

**Return on Assets**

2011=Return on Asset: Net income / Total Asset

\[
2,945,202,204 / 168,688,543,506
\]

= .017 or 1.7%

2012=Return on Asset: Net income / Total Asset

\[
1,585,233,380 / 207,244,365,339
\]

= .0076 or .76%

2013=Return on Asset: Net income / Total Asset

\[
3,069,357,562 / 225,620,285,172
\]

= .014 or 1.4%

2014=Return on Asset: Net income / Total Asset

\[
3,700,332,233 / 265,912,772,548
\]

= .014 or 1.4%

**Return on Equity**

2011=Return on Equity: Net income / Equity

\[
2,945,202,204 / 15,963,171,945
\]

= 0.1844 or 18.44%

2012=Return on Equity: Net income / Equity

\[
1,585,233,380 / 18,166,882,999
\]

= 0.087 or 8.7%

2013=Return on Equity: Net income / Equity

\[
3,069,357,562 / 20,504,781,695
\]

= 0.149 or 14.9%

2014=Return on Equity: Net income / Equity

\[
3,700,332,233 / 22,526,684,859
\]
= 0.164 or 16.4%

2015= Return on Equity: Net income / Equity
4,016,037,872/ 25,662,659,327
= 0.1565 or 15.65%

Profit Margin

2011= Profit Margin: Net income / Sale
2,945,202,204/ 9,294,372,286
= 0.317 or 31.7%

2012= Profit Margin: Net income / Sale
1,585,233,380 / 10,177,656,171
= 0.153 or 15.3%

2013= Profit Margin: Net income / Sale
3,069,357,562 / 12,412,091,923
= 0.247 or 24.7%

2014= Profit Margin: Net income / Sale
3,700,332,233 / 15,269,470,979
= 0.242 or 24.2%

2015= Profit Margin: Net income / Sale
4,016,037,872/ 15,627,863,370
= .256 or 25.6%

3.3 Profitability Analysis of Uttara Bank:

Return on Assets

2011= Return on Asset: Net income / Total Asset
1,654,949,537/ 97,318,735,604
= 0.017 or 1.7%

2012= Return on Asset: Net income / Total Asset
1,244,403,575 / 123,693,796,893
= .001 or 1.00%

2013= Return on Asset: Net income / Total Asset
1,319,467,473/ 132,110,043,811
= .009 or .99%

2014= Return on Asset: Net income / Total Asset
1,404,251,236/ 140,547,009,594
= .009 or .99%

2015= Return on Asset: Net income / Total Asset
1,511,977,074/ 151,232,385,37
3.4 Profitability analysis of banking sector in Bangladesh by analyzing AB bank, UCB bank, Uttara bank:

3.4.1 Return on Assets = the return of (AB bank + UCB bank + Uttara bank) / 3

2011 = (.0091 + .0170 + .0171) /
Interpretation: Return on assets is an indicator of how profitable a company is relative to its total assets. Return on assets gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets, In 2011 return on assets was 0.0144 or 1.44 percent, In 2012 return on assets was decreased to .0056 or .56 percent, In 2013 return on assets was slightly increased to .0097 or .97 percent, In 2014 return on assets slightly increased to .0099 or 99 percent and In 2015 the return on assets was constantly same. We have found out that in 2011 high significant of return on assets by banking sector in Bangladesh.so we think that 2011 was the leading year of return on assets of banking sector in Bangladesh.

3.4.2 Return on Equity = the return of (AB bank + UCB bank + Uttara bank)/ 3

2011 = (0.0920 + .1844 + .1717) / 3

= 0.1494 or 14.9
Interpretation: Return on equity is a measure of profitability that calculates how many dollars of profit a company generates with each dollar of shareholders' equity. In 2011 return on equity was 0.1494 or 14.94 percent, In 2012 return on equity was decreased to .1013 or 10.13 percent, In 2013 return on equity was slightly decreased to .0783 or 7.83 percent, In 2014 return on equity slightly increased to .1197 or 11.97 percent and In 2015 the return on equity was slightly decreased to 0.1110 or 11.10 percent. So we have found out that in 2011 high significant of return on equity by banking sector in Bangladesh. So we think that 2011 was the leading year of return on equity of banking sector in Bangladesh. So in 2011 was the high significant of return on equity of banking sector in Bangladesh.

3.4.3 Profit Margin = the profit of (AB bank + UCB bank + Uttara bank)/ 3

2011= (0.1600 + .3170 + .2530) / 3

= 0.2433 or 24.33%

2012= (0.1620 + .1530 + .1721) / 3

= 0.1624 or 16.24%

2013= (.0630 + .1490 + .1230) / 3

= 0.0783 or 7.83%

2014= (.0800 +.1640 + .1150) / 3

= 0.1197 or 11.97%

2015= (.0620 + .1565 + .1145) / 3

= 0.1110 or 11.10%
Interpretation: Profit margin is part of a category of profitability ratios calculated as net income divided by revenue, or net profits divided by sales. Net income or net profit may be determined by subtracting all of a company’s expenses, including operating costs, material costs and tax costs, from its total revenue. In 2011 profit margin was 0.2433 or 24.33 percent, In 2012 profit margin was decreased to .1624 or 16.24 percent, In 2013 profit margin was slightly increased to .1818 or 18.18 percent, In 2014 profit margin slightly decreased to .1590 or 15.90 percent and In 2015 the profit margin was increased to 0.1833 or 18.33 percent. So by analyzing the whole banking sector in Bangladesh we have found out that in 2011 high significant of profit margin banking sector in Bangladesh so we think that 2011 was the leading year of profit margin of banking sector in Bangladesh.

4. DATA ANALYSIS AND INTERPRETATION

4.1 Hypothesis testing
<table>
<thead>
<tr>
<th>Particulars</th>
<th>H1</th>
<th>H2</th>
<th>H3</th>
<th>H4</th>
<th>H5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Strongly disagree</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2 = Disagree</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3 = Neither agree or Disagree</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4 = Agree</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>5 = Strongly Agree</td>
<td>10</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
<td>65</td>
<td>81</td>
<td>80</td>
<td>75</td>
</tr>
<tr>
<td>Average ((x))</td>
<td>4.24</td>
<td>3.10</td>
<td>3.85</td>
<td>3.81</td>
<td>3.57</td>
</tr>
<tr>
<td>Standard Deviation (s)</td>
<td>0.86</td>
<td>1.31</td>
<td>0.95</td>
<td>1.58</td>
<td>1.76</td>
</tr>
<tr>
<td>T-test value</td>
<td>6.52</td>
<td>0.34</td>
<td>4.05</td>
<td>2.53</td>
<td>1.48</td>
</tr>
</tbody>
</table>

H0: \(\mu = 3\)
Ha: \(\mu \neq 3\)
N=21
Since the sample size \(n < 30\) therefore we have used t-test.
Hypothesis 1: Competition has a negative relationship with bank profitability in the Bangladesh banking industry.

Question 1: Has Competition a negative relationship with bank profitability in the Bangladesh banking industry?

1 = Strongly disagree, 2 = Disagree, 3 = Neither agree or Disagree, 4 = Agree,
5 = Strongly Agree.

Null hypothesis (H0): Competition has not a negative relationship with bank profitability in the Bangladesh banking industry.

Alternative Hypothesis (Ha): Competition has a negative relationship with bank profitability in the Bangladesh banking industry.

**Calculation value of T for hypothesis 1:**

\[ t_{cal} = \frac{\bar{x} - \mu}{s/ \sqrt{n}}, \]  
with the degree of freedom (df)=n-1

\[ = \frac{4.24 - 3}{0.86/\sqrt{20}} \]

\[ = 6.52 \]

**Interpretation of the result:**

The critical value of t with df 20 at a =0.05 level of significance is

\[ t_{0.025, 20} = 2.086 \] (for two tailed test)

Since \( t_{cal} > t_{0.025, 20} \). Therefore the null hypothesis is rejected or not accepted. So at 5% level of significance, it can be said that Competition has a negative relationship with bank profitability in the Bangladesh banking industry.

Strongly agree 47.62%, agree 33.33 %, neutral 14.29%, disagree 3.57%, and strongly disagree 0% of respondents respectively expressed their opinions with the statement that
Competition has a negative relationship with bank profitability in the Bangladesh banking industry.

Hypothesis 1: 

![Hypothesis 1 Chart]

Hypothesis 2: Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.

Question 2: Do you agree that Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry?

1 = Strongly disagree, 2 = Disagree, 3 = Neither agree or Disagree, 4 = Agree, 5 = Strongly Agree.

Null hypothesis (H0): Competition has not a negative relationship with bank risk-taking in the Bangladesh banking industry.

Alternative Hypothesis (Ha): Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.

Calculation value of T for hypothesis 2: 

\[ T_{Cal} = \frac{\bar{x} - \mu}{s/\sqrt{n}} \]

with the degree of freedom (df) = n-1
\[
\frac{(3.10-3)}{1.31/\sqrt{20}} = 0.34
\]

**Interpretation of the result:**

The critical value of \( t \) with \( df = 20 \) at a \( \alpha = 0.05 \) level of significance is

\[ t_{0.025, 20} = 2.086 \] (for two tailed test)

Since \( t_{\text{cal}} < t_{0.025, 20} \). Therefore the null hypothesis is accepted. So at 5% level of significance, it can be said that Competition has not a negative relationship with bank risk-taking in the Bangladesh banking industry.

Strongly agree 14.29%, agree 33.33%, neutral 14.29%, disagree 23.81%, and strongly disagree 14.29% of respondents respectively expressed their opinions with the statement that Competition has not a negative relationship with bank risk-taking in the Bangladesh banking industry.

Hypothesis 3: Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.
Question 3: Do you agree that competition has a negative relationship with bank risk-taking in the Bangladesh banking industry?

1 = Strongly disagree, 2 = Disagree, 3 = Neither agree or Disagree, 4 = Agree,

5 = Strongly Agree.

Null hypothesis (H0): Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.

Alternative Hypothesis (Ha): Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.

**Calculation value of T for hypothesis 3:**

\[ T_{-\text{cal}} = \frac{\bar{x} - \mu}{s/\sqrt{n}}, \text{ with the degree of freedom (df) } = n-1 \]

\[ = (3.85-3)/(0.95/\sqrt{20}) \]

\[ = 4.05 \]

**Interpretation of the result:**

The critical value of t with df 20 at a =0.05 level of significance is \( t_{0.025, 20} = 2.086 \) (for two tailed test)

Since \( t_{-\text{cal}} > t_{0.025, 20} \). Therefore the null hypothesis is rejected or not accepted. So at 5% level of significance, it can be said that Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.

Strongly agree 38.10%, agree 42.86%, neutral 9.52%, disagree 9.52%, and strongly disagree 0% of respondents respectively expressed their opinions with the statement that Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.
Hypothesis 4: Risk-taking has a positive relationship with bank profitability in the Bangladesh banking industry.

Question 4: Do you think that Risk-taking has a positive relationship with bank profitability in the Bangladesh banking industry?

1 = Strongly disagree, 2 = Disagree, 3 = Neither agree or Disagree, 4 = Agree,

5 = Strongly Agree.

Null Hypothesis (Ho): Risk-taking has not a positive relationship with bank profitability in the Bangladesh banking industry.

Alternative Hypothesis (Ha): Risk-taking has a positive relationship with bank profitability in the Bangladesh banking industry.

**Calculation value of T for hypothesis 4:**

\[ t_{\text{cal}} = \frac{(\bar{x} - \mu)}{(s/ \sqrt{n})} \]

with the degree of freedom (df) = n-1

\[ = \frac{(3.81 - 3)}{(1.58/\sqrt{21})} \]

\[ = 2.35 \]

**Interpretation of the result:**

The critical value of t with df 20 at a =0.05 level of significance is

\[ t_{0.025, 20} = 2.086 \] (for two tailed test)
Since \( t-\text{cal} > t_{0.025, 20} \). Therefore the null hypothesis is rejected or not accepted. So at 5% level of significance, it can be said that Risk-taking has a positive relationship with bank profitability in the Bangladesh banking industry.

Strongly agree 14.29%, agree 33.33%, neutral 14.29%, disagree 9.52%, and strongly disagree 23.80% of respondents respectively expressed their opinions with the statement that Risk-taking has a positive relationship with bank profitability in the Bangladesh banking industry.

Hypothesis 5: There is a cascading relationship among market competition and bank innovation, risk-taking, profitability.

Question 5: Is there a cascading relationship among market competition and bank innovation, risk-taking, profitability?

1 = Strongly disagree, 2 = Disagree, 3 = Neither agree or Disagree, 4 = Agree,

5 = Strongly Agree.

Null Hypothesis (Ho): There is not a cascading relationship among market competition and bank innovation, risk-taking, profitability.
Alternative Hypothesis (Ha): There is a cascading relationship among market competition and bank innovation, risk-taking, profitability.

**Calculation value of T for hypothesis 5:**

\[ t_{\text{cal}} = \frac{\bar{x} - \mu}{s / \sqrt{n}} \]

\[ = \frac{(3.57 - 3)}{(1.76 / \sqrt{21})} \]

\[ = 1.48 \]

**Interpretation of the result:**

The critical value of \( t \) with \( df = 20 \) at \( \alpha = 0.05 \) level of significance is

\[ t_{0.025, 20} = 2.086 \] (for two tailed test)

Since \( t_{\text{cal}} > t_{0.025, 20} \). Therefore the null hypothesis is accepted. So at 5% level of significance, it can be said that there is not a cascading relationship among market competition and bank innovation, risk-taking, profitability.

Strongly agree 4.76%, agree 19.05%, neutral 4.76%, disagree 42.86%, and strongly disagree 28.57% of respondents respectively expressed their opinions with the statement that There is not a cascading relationship among market competition and bank innovation, risk-taking, profitability.
4.2 FINDINGS:

1. Strongly agree 47.62%, agree 33.33 %, neutral 14.29%, disagree 3.57%, and strongly disagree 0% of respondents respectively expressed their opinions with the statement that Competition has a negative relationship with bank profitability in the Bangladesh banking industry.

2. Strongly agree 14.29%, agree 33.33%, neutral 14.29%, disagree 23.81%, and strongly disagree 14.29% of respondents respectively expressed their opinions with the statement that Competition has not a negative relationship with bank risk-taking in the Bangladesh banking industry.

3. Strongly agree 38.10%, agree 42.86%, neutral 9.52%, disagree 9.52%, and strongly disagree 0% of respondents respectively expressed their opinions with the statement that Competition has a negative relationship with bank risk-taking in the Bangladesh banking industry.

4. Strongly agree 14.29%, agree 33.33%, neutral 14.29%, disagree 9.52%, and strongly disagree 23.80% of respondents respectively expressed their opinions with the statement that Risk-taking has a positive relationship with bank profitability in the Bangladesh banking industry.

5. Strongly agree 4.76%, agree 19.05%, neutral 4.76%, disagree 42.86%, and strongly disagree 28.57% of respondents respectively expressed their opinions with the statement There is not a cascading relationship among market competition and bank innovation, risk-taking, profitability.

8. CONCLUSION:

This research aimed at investigating the impact of risk and competition on bank performance to fill the gap in the existing banking literature in Bangladesh. Based on the empirical evidence, it can be concluded that competition negatively influences the performance of banks in terms of profitability and efficiency. The continuous reduction of bank spread margin under high rate of inflation and the degree of accelerated competition contribute to such negative impact on performance. Moreover, it is also highly likely that the non-price competition in the form of...
Branch expansion and advertisement also exists in the banking sector of Bangladesh as most of the private banks have been experiencing the expansion phase. Such non-price competition may favorably affect the financial deepening of a developing country like Bangladesh where financial sector is mostly underdeveloped in nature. However, due to the absence of deposit rate controls under liberalization, the inefficiencies created by the non-price competition may outperform the gains from financial deepening by creating inferior substitutes for customers and by eroding the franchise value of banks, particularly private banks.

Therefore, based on the empirical evidence, it can be argued that the regulatory authority needs to ensure a structure for the banking sector with necessary incentive for banks, particularly for private banks, to improve their profitability and efficiency. No doubt, various changes under financial deregulation have been successful in accelerating the level of competition. The issue is whether this changing level of competition can enhance the banking sector performance in a developing country like Bangladesh. It is also evident that Bangladesh Bank is going to deregulate the banking sector further by Permitting nine new private banks to enter into the market. Such decision accelerates the competition level in the future, which may result in a decreased performance. Moreover, the issuance of BRPD circular letter illustrates the importance of encouraging private and foreign banks to stimulate agriculture and SME sectors for the economic prosperity of the country. How can it be done? Based on the findings, there is no incentive for banks at this point of time. Under these circumstances, it is vital for the regulatory authorities to revisit the structural changes in order to avoid the occurrence of banking sector instability argued by the existing literature.

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