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Credit Risk Management and Loan Portfolio Performance: Evidence from Selected Banks of Bangladesh

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Abstract
The increasing non-performing loan ratio and the inability of maintaining the standard capital adequacy have triggered deteriorating performance for the Bangladeshi banking industry. Hence, this research aims to assess the impact of credit risk management on the loan portfolio performance of Bangladeshi commercial banks. Given the current records of non-performing loans (NPL) of both state-owned commercial banks (SOCBs) and private commercial banks (PCBs), it is hypothesized that credit risk management (CRM) is a crucial driver of bank's loan portfolio performance. A comparative analysis of the Capital Adequacy Ratio (CAR) and the Non-performing Loan Ratio (NPL) of SOCBs and PCBs is conducted. The analysis demonstrates that the SOCBs had higher NPL and lower CAR than the PCBS, adversely affecting the industry average. To identify the influence of CRM over loan performance, data has been collected from 98 bank employees working in the CRM divisions of 21 listed commercial banks. Employees of 18 PCBs and 3 SOCBs are surveyed in this study. Structural Equation Modelling (SEM), based on Covariance, is applied to analyse the data. The findings reveal that the components of CRM: credit policy and appraisal, and credit recovery policy have significant associations with the loan portfolio performance. However, few of the CRM factors are found to have insignificant linkage with the overall risk of the banks. The outcomes of the research have crucial policy and implications as it highlights the significant drivers of loan performance, which can be controlled and improved to mitigate the NPL issue and to influence superior bank performance.
Keywords: Non-performing loan, Credit risk management, Capital adequacy ratio, Covariance based Structural Equation Modelling (SEM), Credit policy and appraisal, Credit recovery policy, Loan portfolio performance.
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1. Introduction

Whenever it is about the effective functioning of a banking institution, the overall risk management system must be efficient enough for the enduring success and survival of that particular banking institution. Among all categories of risks associated with the banks and the market, three major types of risks (such as credit risk, operational risk, and market risk) faced by the banks have been identified in the guidelines provided by the Reserve Bank of India in October 1999. The moment a bank, which is the borrower, or the counter party cannot follow the obligations following the terms and conditions of the agreement, the potential loss or default risk occurs which is known as the credit risk. The primary concern of a bank is to mitigate this credit risk as much as possible. An overall credit risk management (CRM) system must be incorporated in such a way that the bank can ensure no counter party is making any default to meet the commitments within due time. The other risk categories such as the market risk is occurred through the changes in the market variables- interest rates, stock prices, foreign exchange etc. (Raghavan, 2003). In such cases, it is quite difficult for the bank to predict and minimize the market risk to a great extent because of the macro-economic influences that are not controllable. So any of the banking institution should focus on the credit risk management system to survive with its operations in the market.

Jordan (2015) has examined the significant influence of CRM indicators which are capital adequacy, credit interest or credit facilities, facilities loss or net facilities, leverage ratio, and NPL ratio, over the Jordanian commercial banks' financial performance while incorporating cross-sectional analysis. Mushafiq et al. (2023) has conducted a recent study on 69 non-financial companies from the Pakistan Stock Exchange that finds out Altman Z-score (credit risk proxy), leverage, and firm size have significant influence over the financial performance of the sample companies. Another study has applied dynamic panel data techniques that found out the negative significant influence of net non-performing assets (credit risk measure) on the Return on Assets (ROA) and Return on Equity (ROE) of 36 commercial Indian banks (Chaudhary & Kumar, 2023). Islam (2023) has investigated the macroeconomic factors of the credit risk of a few Bangladeshi commercial banks using a two-step system GMM technique.

Having majority of the previous researches based on secondary data, this study focuses on incorporating Covariance based Structural Equation Modelling (SEM) based on primary data. It investigates the impact CRM

has on the overall performance of the loan portfolio of selected commercial banks of Bangladesh. CRM department of most of the banks work for minimizing the credit risk of their banks. Considering the current records of non-performing loans (NPL) of many of the banks in Bangladesh, CRM process must be considered as a vital factor to influence the loan portfolio performance of the selected banks. So, this research work focuses on finding out varying phenomena of the CRM to ensure better loan portfolio performance while minimizing the ratio of NPL of the mentioned banks.

One of the major problems of the study is that it is difficult to find out the confidential information from most of the selected banks because the CRM process is a matter of significant aspect of any bank which is giving loans to the borrowers. Whenever there are any defaulters, it entirely has a point to claim how the bank's CRM department is working; whether there is any lacking in the credit policy or loan recovery policy. So the challenge was to find out such confidential information through survey. And also the whole CRM process is a complicated one which cannot be defined with just few factors. Thus the main challenge was to collect data through survey from the mentioned departments of the banks who may not be much willing to share their confidential information regarding CRM and their particular reasons behind NPL.

This research aims at developing a better understanding of the components of CRM as well as the guidelines of CRM process. Having a less developed capital market, Bangladesh has to be more concerned about building the strength of the overall banking system. It is very essential to grow the interest of the potential investors in various investment opportunities while growing the country's overall banking system considering its CRM and minimizing NPL ratio of the banks. To ensure this, the banks must develop a strong i) credit policy and appraisal system, ii) loan documentation, supervision and monitoring system and iii) an effective credit recovery policy. A major component of credit risk has to be identified among the three specific components of credit risk- transaction risk, intrinsic risk, and concentration risk. The proposed major component is supposed to play a vital role in a bank's loan portfolio performance.

This research belongs to the very few exploratory researches in Bangladesh through which the role of CRM on the loan portfolio performance of selected commercial banks of Bangladesh is shown while using primary data. Through reducing loan defaults, the banks can increase their profitability as well as protect their assets by executing a well-developed CRM system.

The general objective of the study is to inspect how CRM activities of the selected banks can influence the loan portfolio performance of the chosen banks from the context of Bangladesh.

The specific objectives of the study are:

- To identify specific measures for finding out the activities that are required to ensure the execution of appropriate credit policy and prepare credit appraisal
- To examine the impact of loan documentation, frequent loan supervision and monitoring on the minimization of credit risk
- To examine the effective loan recovery policies practiced by selected banks that play vital role in managing different types of risk influencing the banks' loan portfolio.

2. Theoretical Background and Literature Review

2.1 Theoretical Background

2.1.1 Liquidity Theory of Credit

According to this theory, which was first proposed by (Emery, 1984), businesses with credit restrictions are more likely to obtain credit than those who often utilize financial intermediaries. The core justification for this idea is that when a company's finances are compromised, the offer of trade credit will take the place of the reduction in the credit deal from lending institutions. As a result, companies with superior liquidity or access to the capital markets are more likely to save those whose access to credit is restricted. Many techniques have looked for actual data to support this notion.

Dick-Nielsen et al. (2012) argue that corporations obliged to support credit conditions for their consumers as the liquidity of the market is squeezed to ensure its survival while considering small enterprises as a cash-rationed corporation proxy. A negative correlation between a buyer's access to other sources of capital and commercial credit is anticipated, as financially liberal enterprises are less likely to seek trade credit conditions and are more expected to maintain the same. A previous study by Petersen and Rajan (1997) gathered evidence to confirm this negative association.

2.1.2 Tax Theory of Credit

The tax theory of credit is another theory that applies in credit management and demonstrates that the ability to gather funds from other sources shapes the borrowers' decision on whether to go for a loan. This theory offers the result that is relevant to the trade-off principle, which balances a company or entity 's tax supports and insolvency costs so that the overall firm value can be increased (Zhong, 2013). The post-payment that the seller provides involves an implied rate of interest that is embedded in the price.

Consequently, the buyer should determine the real cost of the various financing alternatives. In this context,

Brick and Fung (1984) find the tax effect of relating the cost of commercial credit to the cost of other forms of funding. If buyers and sellers are in separate tax brackets, they don't have the same rate of borrowing. The authors believe that businesses prosper by providing trade credit in a high tax bracket compared with those in low tax brackets.

2.1.3 Credit Risk Theory

According to Crosbie & Bohn (2003), there are now three quantitative methods for analyzing credit risk: the structural technique, the reduced model of evaluation, and the incomplete information method. Structural models are utilized to measure the likelihood of default for a company depending on the valuation of its assets and liabilities. The general principle is that a corporation (with limited liability) fails if its asset value is less than the firm's debt. These models are generally known as 'Structural Model' and depend on the variables linked to a specific borrower.

Reduced form models typically assume that default has an external cause. They envision default as a chance event that has little impact on the financial sheet of the business. A Poisson event is what is referred to as this uncertain event. This kind of credit risk analysis is known as default intensity analysis since Poisson models examine the intensity or likelihood of an event occurring.

Merton (1974) introduces the credit risk theory otherwise known as structural theory, which argued that the default case resulted from the growth of the assets of the company, which was illustrated by a diffusion mechanism with constant parameters. They are used to measure a company's risk of default depending on the value of its assets and debts. With this strategy, the biggest problem is that one does not consider the market worth of the assets of a company. Annual report by a bank contains only an accounting view of their assets. However, the market value of equity is measurable for every publicly listed bank, as is its liabilities. The mentioned analysis is identified as Contingent Claims Analysis (CCA), which uses equity prices and accounting information to calculate the default risk of publicly listed financial institutions (Chatterjee, 2015).

This theory applies to the research, as credit risk is the primary factor of the analysis. The theory explains how commercial bank managers perceive the idea of credit risk, how loan defaulters struggle to pay their risk-driven loans, and how commercial bank managers can build strategies to retrieve loan payments (Abdallah, 2016).

2.1.4 Theory of Information Asymmetry

Information asymmetry specifies associations where one party possesses information, and another does not have the information. Therefore, to the degree that one of the parties to the funding arrangement has more or less credible information than another, the asymmetry of the information tends to be a significant limitation in the funding of the project. Banks, in their ability as financial intermediaries, operate the flow of funds to the deficit units in need of funding, to the borrowers, which is important in this process to provide more information to benefit from experience in borrowers' evaluation of creditworthiness (Tupangiu, 2017).

Adverse selection and moral hazards associated with client, have resulted in a massive rise in NPL over the years ((Bester, 1994); Beyond and Gobbi, 2003). This theory is relevant in that when debtors provide the lenders with accurate and thorough information about their financial position while seeking credit, lenders (banks) may better be able to make appropriate credit decisions and thus reduce credit risks. Once credit defaults are reduced, the non-performing assets ratio decreases increasing the overall performance of the loan portfolio for financial intermediaries.

2.2 Empirical Review

Credit risk management is defined as a management approach that helps optimize the risk-adjusted return value of a bank by holding the possibility of credit risk within appropriate parameters, according to the study of Casu et al. (2006). Nikolaidou and Vogiazas (2014) described CRM as the amalgamation of organized tasks and monitoring activities and managing risks that an organization faces through the introduction of major risk management strategies that align with the organizational objectives.

As per the report provided by Raghavan (2003), the critical functions of CRM are " identifying, measuring, and more notably, monitoring the bank's profile." According to this definition, CRM aids financial intermediaries in examining, tracking, and assessing the different practices that reduce credit risk. It is necessary to understand that risk management approaches are not adapted to eradicate risks but attempt to control possibilities and hazards resulting in risk (Bezzina, Grima, & Mamo, 2014). Earlier studies have shown tight Credit Risk Controls (CRC) results in low default chances (Ross, Westerfield, & Jordan, 2007). Hence, credit risk might be mitigated by using danger-based assessment, agreements, credit protection, stiffening, and widening (Ross, Westerfield, & Jordan, 2007).

To determine the extent to which the asset return (ROA) as a factor in bank profitability is impacted by the default rate (DR), cost per loan asset (CLA), and capital adequacy ratio (CAR), Kurawa and Garba (2014) investigated the influence of CRM over the financial performance of Nigerian banks. The findings showed that CRM, as estimated by three independent variables, had a significant beneficial impact on the financial performance of Nigerian banks.

The variation in credit risk reflects variations in the quality of the loan portfolio managed by a bank affecting the subsequent success of the bank (Cooper, III, & Patterson, 2003). Miller and Noulas (1997) stated that, where financial institutions are more subjected to risky loans, NPL would accumulate along with lower yields. Credit risk is the most crucial and costly risk for financial intermediaries. Its effect is substantial in comparison with any other banking sector-related risk, as it poses a threat to the institutional solvency (Chijoriga, 2011).

The credit risk rating approach, according to Mosharrafa (2013), is a useful strategy for managing credit since it enables the bank to take into account various components of the risk associated with numerous credit transactions. Credit risk measurements are important performance indicators for financial organizations, according to Lahsasna, Ainon, and Wah (2010). This is because poor decisions can result in enormous losses. A loss of revenue may result from a poor evaluation of the credit risk (Gouvêa, 2007). Another study (Wu et al., 2010) emphasized that CRM and the base for loan decision-making in financial institutions are credit risk appraisal and CRM, respectively. Regardless of advancements in credit appraisal techniques and portfolio diversification, Angelini et al. (2008) continued to underline that risks remain a substantial barrier to efficient lending. The Basel Committee has described credit rating as a risk 'summary indicator' involved in individual credit, embracing a potential evaluation of loss due to a counterparty 's default by analysing related quantitative and qualitative data. Bangladesh has initiated arrangements for the application of the Basel-III framework for banking companies following the global standard from 2014 (Mohammad & Onni, 2015).

The loan portfolio is considered not only the biggest asset but also a route prevailing to earn revenue but one of the greatest risk roots for a sound and stable financial institution (Evelyn Richard, Peterson, & Bohman, 2008). Poor CRM, being a threat to the banking industry, is the most critical of all the risks associated with financial intermediaries (Chijoriga, 1997). The loans should be systematically distributed according to the well-established lending policies (Schreiner, 2003). Well-structured credit policies upgrade the effectiveness and efficiency of the organization (Ledgerwood, 1999). The most vital responsibilities of the bank directors and administration are the development and execution of loan policies. In this task, the Board of Directors takes the services and cooperation of credit officers of the bank, who are very well skilled and experienced in lending strategies, and who are also acquainted with intrinsic and extrinsic factors that directly impact the bank's lending operations.

Loan appraisal is termed as an application/demand for funds, assessed by the financial intermediary. The issues to be emphasized during the evaluation include client's purpose, genuineness of need, borrower's repayment ability, loan quantity, and security. Loan assessment is crucial in keeping loan losses to a minimum, so if those officers assigned for loan assessment are incompetent, the likelihood of lending money to unworthy Consumers would be high (Boldizzoni, 2008). The question to be addressed well before the other is whether the borrower will payout the loan as scheduled, with a reasonable margin of error or not. Generally, this includes a thorough analysis of six factors: Character, capacity, cash, collateral, conditions, control (Das & Das, 2007). Another technique for loan appraisal is the CRG analysis, which involves the measurement of five types of risk: financial risk, company or market risk, management risk, security risk, and partnership risk.

Loan documentation is an integral part of CRM for financial institutions. The documentation does verify a legitimate arrangement between the debtor and the lender bank. The papers are of significant value to the banks, as they guarantee the integrity of fundamental evidence in any loan in advance disputes between the parties (Das & Das, 2007). Loan documentation procures written evidence of the transaction, identifies the borrowers, co-borrowers and guarantors. Documentation lets the bank provide security provisions to preserve the bank's interest. Proper documentation is the pre-requisite of a loan disbursement (Hossain, 2012).

Prior researches have found that high credit risk controls contribute to low default risks (Ross, Westerfield, & Jordan, 2007). The use of hazard-based assessment, contracts, collateral security, tightening and extending strategies could mitigate the credit risk (Ross, Westerfield, & Jordan, 2007). There can be several facets and structures that an organization can set separate regulations for receiving borrowers' money Moti et al. (2012). Continuous monitoring of the debtor accounts can make it possible for the lender to predict the problems and assist in taking corrective action to address the negative effect on the loan portfolio. Credit recovery policy also plays a pivotal role in CRM as well as overall loan portfolio performance. CRM's recovery unit should explore all strategies for optimizing recovery, including placing clients in receivership or liquidation if necessary (Hossain, 2012).

The existing literature mostly emphasizes on the assessment of CRM and its influence over a bank’s performance. On the other hand, there is little or no research on the CRM and loan portfolio performance nexus in Bangladesh. Most of the previous studies did not address the crucial activities related to CRM which can affect the loan performance. This research attempts to mitigate the gap in existing literature by analyzing the impact of the key CRM functions such as credit appraisal, loan documentation, credit supervision and recovery policy on the loan portfolio performance of selected banks of Bangladesh.

3. Conceptual Framework

According to the review of the literature, the following conceptual framework is generated:

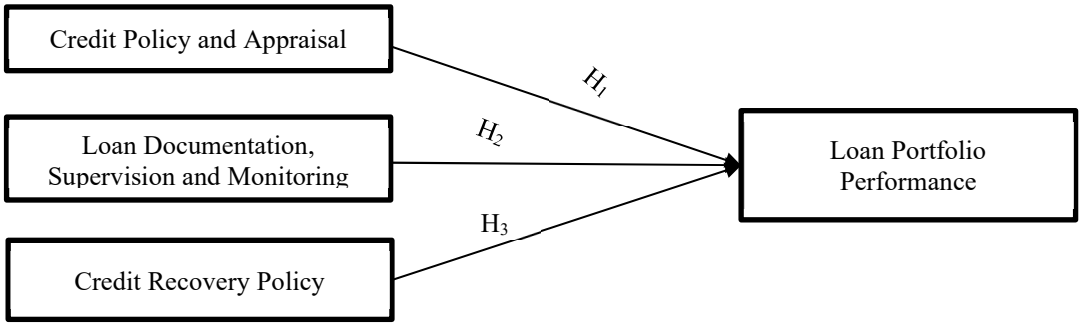

Figure 1: Conceptual Framework of the Study

3.1 Hypothesis Development

According to the review of the literature, the following hypothesis are developed to investigate the relationship between credit risk management and loan portfolio performance of commercial banks in Bangladesh.

H_1: Credit policy and appraisal have a significant relationship with the loan portfolio performance.

H_2: Loan documentation, supervision and monitoring have a significant relationship with the loan portfolio performance.

H_3: Credit recovery policy has a significant relationship with the loan portfolio performance.

4. Research Methodology

In order to achieve the objectives of the study, it has incorporated both qualitative and quantitative research methods. The methodology is discussed below:

4.1 Data Collection

This study incorporates both primary and secondary data. Primary data is gathered using a well-developed questionnaire. Around 21 banks (16 private commercial banks (PCBs), 3 state-owned commercial banks, and two Islami Shariah based PCBs) have been visited to get the best possible response from the sample of the study. Basically, the CRM Departments of all those selected banks have been reached out to collect the responses from the executives of those particular departments who have enough understanding about how their CRM system is being handled.

4.2 Questionnaire Design and Analysis

The survey questionnaire is developed based on the three research hypothesis to get the impact of i) Credit Policy and Credit Appraisal, ii) Loan Documentation, Loan Supervision and Monitoring, and iii) Loan Recovery policy on the CRM as a whole. And at the end of these evaluation through the survey questionnaire, the overall impact on the Loan Portfolio performance is examined while considering concentration risk as the major component of credit risk (according to the respondents' responses). Some data related to this loan portfolio performance is collected through secondary sources- annual reports of the selected banks and available documents.

4.3 Sample Design

The sample design deals with identifying the target population, defining the sample size and sampling method. The target population for this study is all the banks that are serving in the banking system of Bangladesh. Under the Probability sampling techniques, simple random sampling method is applied to gather the primary data. To estimate the sample size (ss) following formula is used:

$$ss = \frac{Z^2 \times p \times (1 - p)}{c^2}$$

Where:

Z = Z value (e.g. 1.96 for 95% confidence level)

p = percentage of selecting a choice, expressed as decimal (0.5 is used for sample size needed)

c = confidence interval (10% has been used in this research)

Using the above formula, the sample size is supposed to be 96 and the researcher has selected total sample size as 98. The sample of the study includes 98 respondents from 21 selected commercial banks among which 18 are PCBs and three are state-owned commercial banks.

5. Findings and Analysis

5.1 Descriptive Statistics

Descriptive statistical analysis is conducted to evaluate the demographic characteristics of the study respondents. The descriptive analysis of participants' gender, age, and level of experience is demonstrated below:

5.1.1 Gender

Table 1 shows that out of the 98 respondents, 59.2% were male and the rest 40.8% were female.

Table 1: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	58	59.2	59.2	59.2
	Female	40	40.8	40.8	100.0
	Total	98	100.0	100.0	

5.1.2 Age

Table 2 illustrates that most of the participants aged between 32 to 37 years (25.5%), followed by 38 to 43 years (22.4%), 26 to 31 years (22.4%), 44 to 49 years (21.4%), 20 to 25 years (5.1%), and 50 or above (3.1%).

Table 2: Age of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 to 25 years	5	5.1	5.1	5.1
	26 to 31 years	22	22.4	22.4	27.6
	32 to 37 years	25	25.5	25.5	53.1
	38 to 43 years	22	22.4	22.4	75.5
	44 to 49 years	21	21.4	21.4	96.9
	50 or above	3	3.1	3.1	100.0
	Total	98	100.0	100.0	

5.1.3 Experience

The level of working experience of each respondent is assessed. The descriptive statistics shows that most of the respondents (27.6%) have an experience of 8-11 years working in a bank. 25.5% of the participants stated that they have been working in a bank for 4-7 years, followed by respondents with 12 years or more experience (24.5%), respondents with 1-3 years' experience (18.4%), and with less than 1 year experience (4.1%). Thus, the descriptive analysis reports that most of the respondents are well-experienced bankers with 4 to 12 years of experience, working in the credit risk related departments of respective banks (Table 3).

Table 3: Level of Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	4	4.1	4.1	4.1
	1-3 years	18	18.4	18.4	22.4
	4-7 years	25	25.5	25.5	48.0
	8-11 years	27	27.6	27.6	75.5
	12 years or above	24	24.5	24.5	100.0
	Total	98	100.0	100.0	

5.1.4 Most Vital Component of Credit Risk

The respondents have been asked which component of credit risk they think is the most vital one to be considered in a bank's loan portfolio (Table 4). Most of the respondents (62.2%) think concentration risk is the most vital credit risk component, followed by transaction risk (34.7%), and intrinsic risk (3.1%). Concentration risk is the combination of transaction risk and intrinsic risk. Transaction risk is associated with how banks select, underwrite, and operate individual loans. This risk has its influences on the fluctuation that occurs in the quality of credit provided by the banks and other earnings. On the other hand, unlike the transaction risk, intrinsic risk goes beyond the individual loans and is associated with the particular chain of businesses or loans provided to particular businesses or industry (Das & Das, 2007). As a whole, according to the results of the study, the combination of these two risks defines the portfolio concentration on which more importance should be given.

Table 4: Which component of credit risk do you think is the most vital one to be considered in a bank's loan portfolio?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Transaction Risk	34	34.7	34.7	34.7
	Intrinsic Risk	3	3.1	3.1	37.8
	Concentration Risk	61	62.2	62.2	100.0
	Total	98	100.0	100.0	

Source: Researcher's survey

5.1.5 Preferred Credit Risk Management Dimension

Which dimension of CRM the credit risk managers prefer has been asked (Table 5). Most of the survey participants argue that preventive measures (82.7%) are the most preferred CRM dimension followed by the curative measures (17.3%) (see figure 3). Preventive measures deal with the prior actions to be taken by the banks in terms of assessing, measuring and pricing the risks; whereas curative measures deal with the post-sanction activities to minimize the loan losses.

Table 5: Which dimension of credit risk management should be preferred?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Preventive measures	81	82.7	82.7	82.7
	Curative Measures	17	17.3	17.3	100.0
	Total	98	100.0	100.0	

Source: Researcher's survey

5.1.6 Significant Factors Concerning Preventive Measures of CRM

The significant factors that are concerned with the preventive measures of CRM are also assessed (Table 6). Most of the respondents argued that risk assessment and measurement (44.9%) is the most significant factor of preventive measures, followed by better credit portfolio diversification (38.3%), and early warning system to pick early signals of future defaults (16.3%). This result indicates that the bank has to assess and measure the associated risks as a preventive measure prior to any potential defaults. After ensuring this significant factor, the bank has to diversify the credit portfolio in a better way as well as create an early warning system (EWS) for mitigating the future defaults.

Table 6: If preventive measures should be preferred, then which factor is the most important one?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Risk assessment and measurement	44	44.9	44.9	44.9
	Early warning system to pick early signals of future defaults	16	16.3	16.3	61.2
	Better credit portfolio diversification	38	38.8	38.8	100.0
	Total	98	100.0	100.0	

Source: Researcher's survey

5.1.7 Significant Factors Concerning Curative Measures of CRM

Table 7 demonstrates that most of the respondents think that legal enforcement (51%) is the most important factor to minimize post-sanction loan losses, followed by loan securitization (45.9%) and risk sharing (3.1%). In case of curative measures, legal enforcement is preferred to other options because that is more applicable in the context of Bangladesh. The credit risk can be minimized to a considerable extent once such legal enforcement is executed properly.

Table 7: If curative measures should be preferred, then which factor is the most important one to minimize post-sanction loan losses?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Loan securitization	45	45.9	45.9	45.9
	Risk Sharing	3	3.1	3.1	49.0
	Legal enforcement	50	51.0	51.0	100.0
	Total	98	100.0	100.0	

Source: Researcher's survey

5.1.8 Security for Loans and Advances Recovery

The employees working in the CRM divisions of the sample banks were asked which security they consider as better for the recovery of loans and advances. Most of the employees reported that primary security (78.6%) is better for loans and advances recovery, whereas 21.4% of them believe that collateral security is enough to recover loans and advances (Table 8). In case of primary security, the borrower himself buys an asset with the assistance of the bank which is going to be used as the cover for the loan in any worst-case scenario. So whenever it is about loans and advances recovery, the banks should prefer primary security to collateral security.

Table 8: Which category of security is better for the recovery of loans and advances?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Primary Security	77	78.6	78.6	78.6
	Collateral Security	21	21.4	21.4	100.0
	Total	98	100.0	100.0	

Source: Researcher's survey

5.1.9 Factors Affecting Fixation of Margin on Loan

The critical factors are also evaluated that influence the fixation of margin on loan, which is a portion of the borrower's contribution against any possible shortage. The respondents argue that nature and type of security, the customers' financial stability, restriction imposed by the Bangladesh Bank are the most influential factors concerning the fixation of margin on loans (Table 9 and Figure 2).

Table 9: Fixation of margin on loan depends on which of the following factor?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nature and type of security	9	9.2	9.2	9.2
	Financial stability of the customer	6	6.1	6.1	15.3
	Restrictions imposed by the Bangladesh Bank	11	11.2	11.2	26.5
	All of the above	72	73.5	73.5	100.0
	Total	98	100.0	100.0	

Source: Researcher's survey

5.1.10 Credit Approval Authority

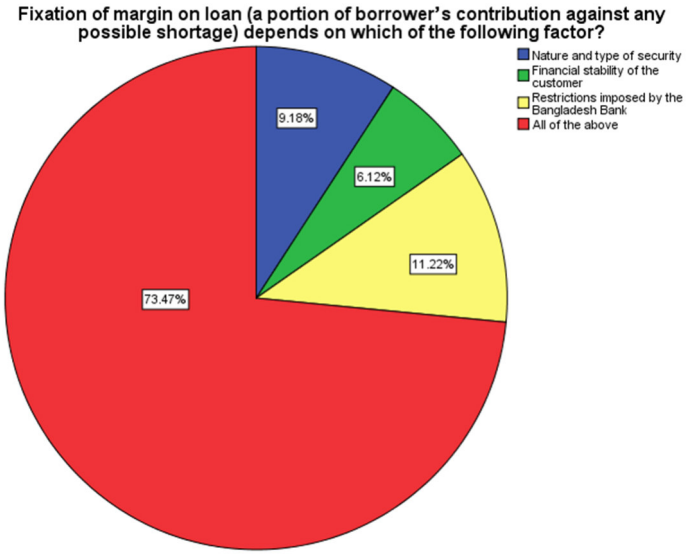

Figure 2: Factors affecting loan margin fixation

The respondents of this study were asked about who should be delegated the credit approval authority to minimize credit risk. Most of them (72.4%) reported that higher authority should be delegated as the credit approval authority. Rest of them (27.6%) believe that the authority should be assigned to the individual assigned executives of the CRM department (Table 10).

Table 10: Should credit approval authority be delegated to individual executives or to the higher authority (i.e., Head of CRM or Board of Directors) to minimize credit risk?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Individual assigned executives	27	27.6	27.6	27.6
	Higher authority	71	72.4	72.4	100.0
	Total	98	100.0	100.0	

Source: Researcher's survey

5.2 Comparative Analysis of Loan Performance and Capital Adequacy of Banks

Employees from 21 commercial banks in Bangladesh have been surveyed. The comparison of banks' non-performing loan (NPL) ratio and capital adequacy ratio (CAR) for the year 2021 is shown in table 11. The output

shows that Rupali bank, one of the leading state-owned commercial banks had the highest NPL ratio (17.50%) in 2021 and EXIM Bank had the lowest NPL ratio (1.0%) in 2021. The CAR performance showed that BRAC Bank and Prime Bank were two of the best performers in terms of capital adequacy maintaining CAR of 20.42% and 17.17% respectively. The analysis shows that Rupali bank, one of the leading state-owned commercial banks had the lowest CAR of 5.6% in 2021 while having the highest NPL as well. The analysis of the study demonstrates that the state-owned banks had higher NPL and lower CAR than the private commercial banks (Table 11).

Table 11: NPL and CAR of Sample Banks

Bank Name	NPL (%)	CAR (%)	Bank Name	NPL (%)	CAR (%)
BRAC Bank	3.9	20.42	Jamuna Bank	2.97	16.42
Dhaka Bank	3.32	14.66	Pubali Bank	3.05	14.23
MTB	5.88	14.41	Trust Bank Ltd	3.65	14.07
UCB	4.41	13.64	PRIME Bank	4.83	17.17
Sonali Bank	15.43	10.71	Exim Bank	1.00	12.09
EBL	3.7	13.87	Mercantile Bank	4.54	14.09
Agrani Bank	16.7	7.55	Uttara Bank	8.46	15.24
DBBL	4.07	16.4	Southeast Bank	4.81	13.86
Rupali Bank	17.50	5.64	City Bank	4.90	14.2
IFIC Bank	6.09	13.1	SIBL	5.18	11.6
AB Bank	4.52	10.74			

Source: Annual reports and financial statements 2021 of the mentioned banks

Figures 3 and 4 show the comparison between the NPL performance of state-owned commercial banks (SOCBs) and private commercial banks (PCBs). Figure 3 illustrates that the SOCBs: Sonali Bank, Agrani Bank, and Rupali Bank had a high NPL ratio in 2021. The output suggests that the SOCBs are more responsible for the high non-performing loan scenario in the banking industry rather than the PCBs. The Rupali bank had the highest NPL ratio and Sonali bank had the lowest NPL ratio among the selected SOCBs. Figure 4 shows that the PCBs had lower NPLs compared to the SOCBs. The NPL ratio of Uttara bank was highest in 2021 as it had a NPL ratio 8.46%. Other than that, the rest of the PCBs had a more or less satisfactory NPL performance compared to the industry average.

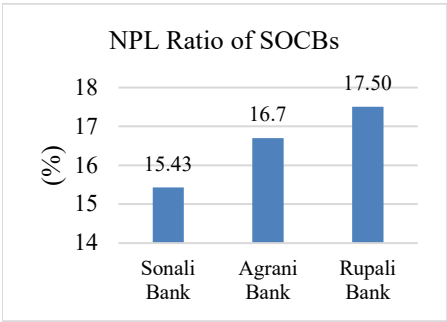

Figure 3: NPL Ratio of State-owned Commercial Banks

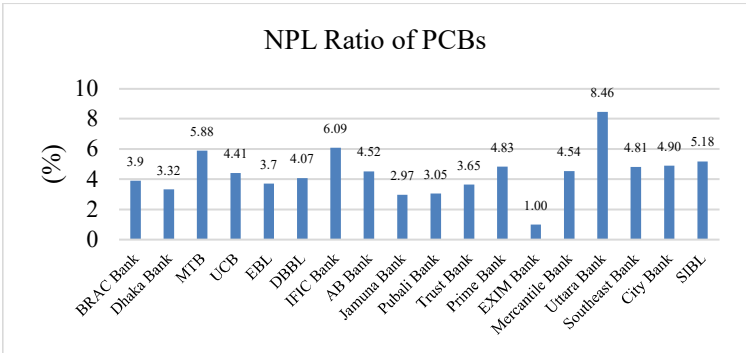

Figure 4: NPL ratio of Private Commercial Banks

The figure 5 and figure 6 demonstrate a comparison between the capital adequacy ratio (CAR) of SOCBs and PCBs. The figure 5 shows that the CAR of the sample SOCBs were lower than the CAR of the PCBs. The CAR of SOCBs ranged between 5.64%-10.71%, which barely fulfils the recommended CAR of 10% in the BASEL III guidelines. Figure 6 demonstrate that the CAR of the sample PCBs exceeded the cut-off of 10%.

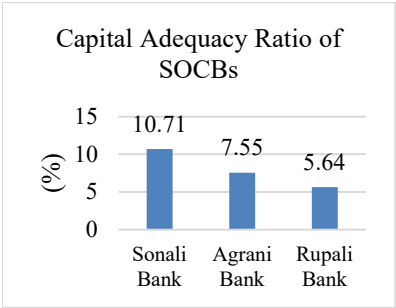

Figure 5: Capital Adequacy Ratio of State-owned Commercial Banks

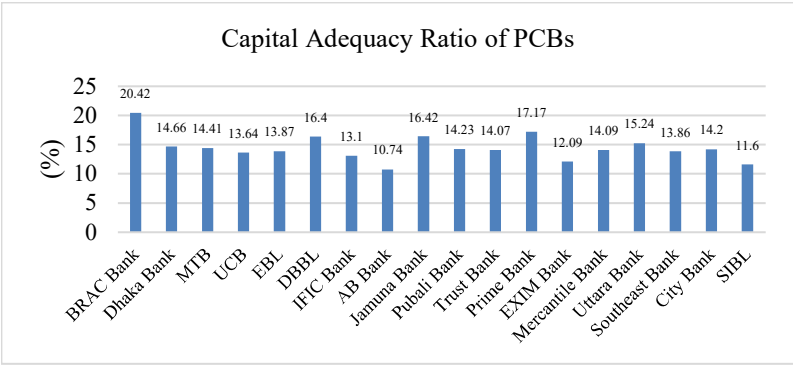

Figure 6: Capital Adequacy ratio of Private Commercial Banks

To sum it up, the SOCBs had higher NPL ratio and lower CAR which adversely affect the banks' loan performance and the overall industry performance. On the other hand, all the PCBs are improving their NPL and CAR to maintain competitiveness and stability of the industry.

5.3 CRM and Loan Portfolio Performance

In order to analyse the relationship between CRM variables and loan portfolio performance, structural equation modelling (SEM) is performed with the study variables using SPSS AMOS software. To measure the loan portfolio performance, the transaction risk, intrinsic risk, and concentration risk pertinent are combined to the loan portfolio. Most of the respondents reported that concentration risk is the most vital one to be considered in a bank's loan portfolio.

The path analysis of the SEM shows that credit policy and appraisal and credit recovery policy have a significant association with banks' loan portfolio performance whereas loan documentation, supervision, and monitoring have an insignificant association (Figure 7). The regression output in table 12 shows that credit policy and appraisal significantly impact a bank's loan performance ($p < 0.05$). Additionally, the credit recovery policy also significantly impacts bank's loan portfolio performance ($p < 0.05$) at 5% significance level. However, loan documentation, supervision, and monitoring do not significantly affect loan portfolio ($p > 0.05$). Thus, the analysis suggests that the policy level decisions of CRM influences loan performance rather than the documentation, supervision, and monitoring system. These findings are consistent with (Ahmed & Malik, 2015) which also reported that credit policy and appraisal has a positive and significant impact on loan performance. Additionally, in line with (Moti et al., 2012), it is found that credit recovery policy has a significant association with loan portfolio performance. Hence, H_2 is rejected, and H_1 and H_3 are accepted.

Table 12: Regression Output (CRM and Loan Portfolio Performance)

Path Direction	Estimate	S.E.	C.R.	P	Relationship
LPP <--- CPA	.446	.176	2.539	.011	Significant
LPP <--- LDSM	2.173	1.327	1.638	.101	Not significant
LPP <--- CRP	-2.272	.794	-2.860	.004	Significant

Source: Researchers' computation

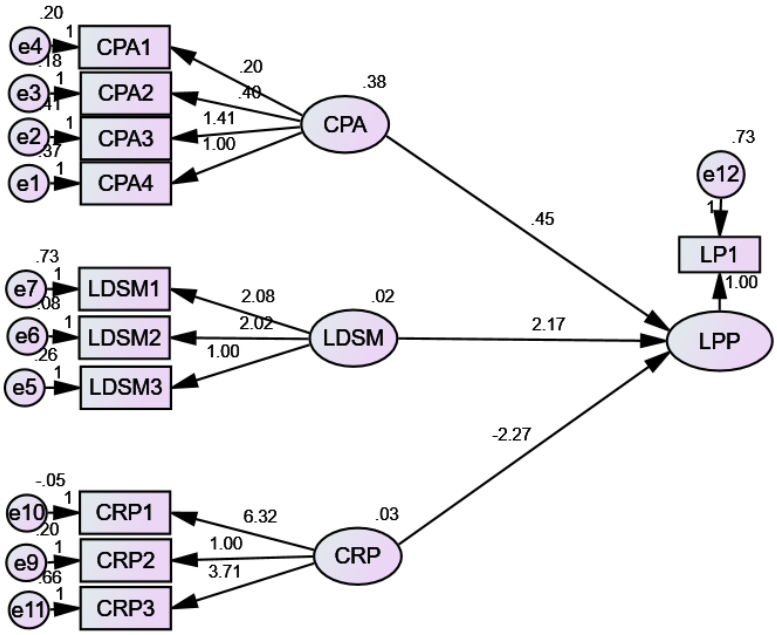

Figure 7: Structural Equation Model (CRM and Loan Portfolio Performance)

5.4 CRM and Financial Risk

The influence of the CRM constructs on the financial risk of banks has been further investigated (table 13). The principal risk component incorporated three types of risk associated with loan portfolio performance namely, financial risk, business risk, and security risk. The path analysis demonstrates that there is no significant influence of credit policy and appraisal, loan documentation, supervision and monitoring, and credit recovery policy on the financial risks of commercial banks (Figure 8).

Table 13: Regression Output (CRM and Financial Risk)

Path Direction	Estimate	S.E.	C.R.	P	Relationship
FR<---CPA	.099	.064	1.549	.121	Insignificant
FR<---LDSM	-.636	.468	-1.361	.174	Insignificant
FR<---CRP	-.267	.198	-1.346	.178	Insignificant

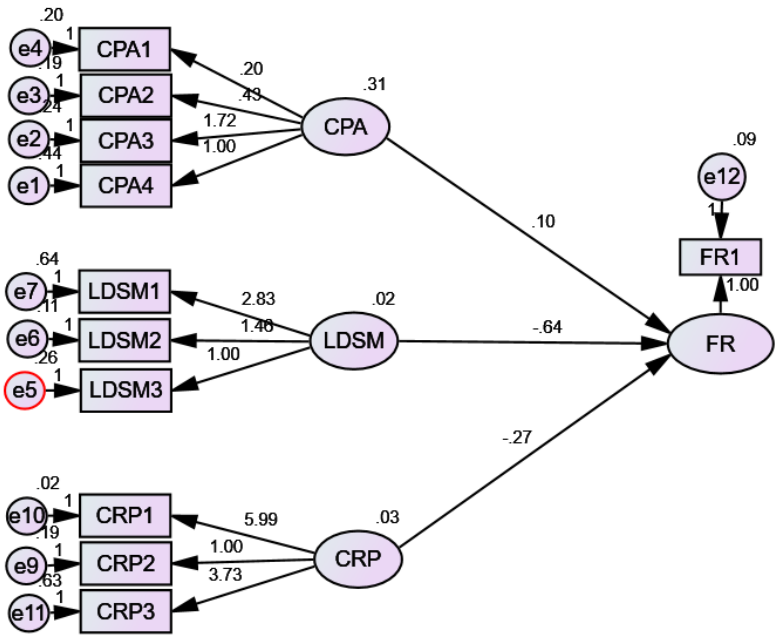

Figure 8: Structural Equation Model (CRM and Financial Risk)

The rationale of this insignificant impact may be that credit policy and appraisal usually do not have a direct influence over the bank's financial risk. Financial risks are generally measured using leverage, liquidity, coverage etc. ratios. Credit policy of a bank may not directly influence these risk-related measures. Similarly, loan documentation, supervision, and monitoring and credit recovery policy is more relevant to loan portfolio performance rather than the financial, business and security risks of commercial banks. Hence, the findings of the study suggest that credit policy and appraisal, loan documentation, supervision, and monitoring, and credit recovery policy have insignificant linkage with financial risks of banks.

6. Conclusion and Recommendation

6.1 Conclusion

This study is going to be beneficial to the potential researchers to develop their understanding about credit risk and its influence over the loan portfolio performance of the selected commercial banks. The findings of the study explain why the banks should not focus on their loan documentation, supervision, and monitoring only. Rather the banks should be more concerned about how an effective credit policy, credit appraisal and credit recovery policy have to be incorporated into their CRM system. It also gives early indications toward the managers of different commercial banks to articulate the best suitable strategies for dealing with the major components of credit risks. The results of the study contribute as the new addition to the previous literature. Along with the efficient strategies, the secondary data analysis reveals the importance of higher profitability of the selected private commercial banks leading toward lower non-performing loans.

6.2 Recommendation

The study recommends that all of these chosen private and state-owned commercial banks have to give more attention toward managing their NPL while minimizing credit risks, thus increasing the bank's profitability. All the effective preventive and curative measures have to be considered as the major significant factors to minimize the loan losses at any cost. Multiple significant measures or components of credit risk suggested in this study have to be incorporated into the banks' effective and efficient strategies to manage credit risks resulting into the profitability of those commercial banks. An early warning system (EWS) might help the banks get prior signals of any potential loan defaults. Diversification in the credit portfolio should be managed efficiently to proceed with better portfolio concentration.

The banks must ensure that the borrowers are accountable with their primary security in advance for the banks' loan recovery. To predict the credit-worthiness of the borrowers, their 6Cs must be assessed properly. According to the results of the study, higher authority must be involved into the credit approval authority to minimize credit risk as much as possible. As an overall observation, a concrete credit policy and appraisal as well as the credit recovery policy must be preferred to loan documentation for managing the overall loan portfolio performance of the banks. According to the secondary data analysis, significant negative relationship between profitability and non-performing loan ratio should also be kept under consideration by the mentioned private commercial banks to ensure higher profitability leading toward lower non-performing loans.

6.3 Limitation of the Study

The study has some specific limitations while being conducted. Those are:

- The executives of CRM department of most of the banks have been unwilling to share their confidential information regarding their CRM system.
- Due to the limitation faced in terms of time, it has been difficult to convince the respondents to share their confidential information.
- Since this research is mostly done incorporating primary data, there has been lack of secondary sources which could be used for the references.

6.4 Suggestions for Further Research

Since this research puts more emphasis on CRM, the researcher recommends further research on other risks such as financial risks, market risks, and interest rate risks. The researcher also realizes that the study could be more developed if more indicators could be incorporated into the analysis of the study and the sample size of the primary data could be increased. Thus, the additional sample size would better represent the banking sector of Bangladesh.

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