



Evaluation of Credit Risk Analysis Methods in Identifying Non-Performing Loan: From the Perspective of Industry Professionals in Bangladesh

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Abstract: *Non-performing loans is a concerning issue for the banking sector. In Bangladesh, the situation is more critical due to the recent growth in the non-performing loans in the industry. This study assessed the 5Cs, 5Ps, and the LAPP method of credit risk analysis in determining the potential non-performing loan. The study surveyed 103 industry professionals from different private and public banks in Sylhet. Multiple regression analysis was used to identify the significant methods in detecting the potential non-performing loans in banks. The results suggested that the LAPP method is 48% statistically effective in identifying non-performing loans. Whereas, 5Ps are 11% effective for the purpose. But this result statistically insignificant. Contrary, the 5Cs method reduces the performance by 20%. Therefore, bankers in Bangladesh suggested the use of the LAPP method as a mechanism for credit risk analysis to tackle the non-performing loan situations.*

Keywords: Non-performing Loan, Credit Risk Analysis, 5Ps, 5Cs, LAPP.

1. Introduction

Non-performing loan in Bangladesh is increasing at irrepressible pace, making the issue a major concern for the banking sector. It is also a foremost reason behind the diminishing reliability among the investor as the performance of the sector is not up to the mark for the last few years. Non-performing loan (NPL) is a major concern for the financial institution as it thrashes the credibility of the institutions. The consistent rise of NPL in the banking sector of Bangladesh is now one of the major challenges faced by the nation. NPL degrades credit rating which influences both financial status and institutions. A challenging problem that arises in this domain is that NPL deteriorates the condition of financial institutions by diminishing their credibility in society. Commercial banks in Bangladesh, for instance, encountering difficulties due to the inadequate process of providing loans. This has been widely adopted as a crucial work for banks to control and take the formation of capital while providing loans. Many forces can be blamed for this recent rise in the NPL in the banking sector. The procedure through which banks decide to disburse loans may have the proper reasoning for the current situation. Credit risk profile analyzes the data with help of technology. For example, identifying customers detaining payment of mortgages, the system is in charge of detection. This leads to a good relationship with customers and disqualifies the credit risk. Poor management, low capital, and reckless lending are the basic sources of credit risk. Bad loans and the reduction of bank profitability derive from improper credit systems.

Without a doubt, the banking sector involves huge ventures. An outstanding accomplishment can be interpreted when executive ability increases return and general expenses are reduced. Then again, beyond comprehending the aspect of defaults and different techniques to take control of, banks will not be able to conduct effectively. Recently financial

institutions have been providing facilities to the clients and companies regarding alteration and configuration to those financing than the newly arrived competitors. Banks implement a variety of models to evaluate credit risk. Among them, 5Cs, 5Ps, and the LAPP method are widely used. The 5Cs method uses five factors- Character, Capability, Condition, Collateral, and Capital. The 5Ps method uses five factors- People, Product, Payment, Perspective, and Protection. Finally, the LAPP method uses four factors- Liquidity, Activity, Profitability, and Potential. But the effectiveness of these conventional techniques in identifying bad loans must be verified from the perspective of Bangladesh. The industry professional, performing the procedure of analyzing and sanction such loans, will be the best judge of such matters. In this study, the major concern is to evaluate the impact of 5Cs 5Ps, and the LAPP method in identifying NPL in banks of Bangladesh.

2. Literature Review

Credit risk method is the application of risk evaluation and control tactics to manage risks faced by an organization (Nikolaidou & Vogiazas, 2014). The objective of credit risk analysis is identify risk associated with actions not to eliminate the risk itself (Frank *et al.*, 2014). It provides banks a framework to facilitate decision making in alignment with goal achievement. Motiet *al.* (2013) analyzed the efficacy of credit management system in Kenya and found that loan recovery policies and credit referencing are significant for loan performance. Boahene *et al.*, (2012) investigated the interconnection between credit risk indicators and profitability of several banks in Ghana and come up with there is significant correlation between the corrective measures taken with profitability. There are a number of methods to evaluate credit risk and a number of studies was conducted on these methods.

Guangul, (2019) showed approval of loans and advances using 5c's credit appraisal methods to assess the Non performing position of Nib international bank and revealed that collateral is one of the most significant variables over the remaining four C's. Soita, (2008) carried out a research in Keneya and found a significant impact of 6C's (Character, Capacity/Completion, Condition, Collateral. Contribution and Commonsense) of credit risk assessment on deterring the level of non-performing loans. A study contrasting role of credit analysis criteria of commercial and private banks found that all the factors in 5 Cs are significant in making credit decisions, but the significance of these factors varies between the two groups of banks (Mahmoud & Abdulhadi, 2017).

Banks' Non-performing loans means the loans which does not earn any revenues from a long period (Caprio & Klingebiel, 2002). Hepşen & Vatansever, (2013) inspected the link between macroeconomic indicators and bank level factors with NPL ratio in Turkish banking industry. Study confirmed that increased nonperforming loan significantly reduces banks risk taking propensity (Lestari, 2018). Saba *et al.*, (2012) studied the interconnection between non-performing loan rates and some leading microeconomic variables such as total overdrafts in the US banking system and came. Alexandri & Santoso, (2015) investigated the influence of external & internal factors of an Indonesian bank on Non-performing loan and found that level of resource efficiency significantly increase the level of nonperforming loan. Ahmed & Malik, (2015) inspected several Pakistani banks; studied the effect of CRM execution on loan performances and found that client appraisal and credit terms has affirmative relation with loan performance, where collection policy & credit risk control have favorable but insignificant relation with loan performance. Bonga *et al.*, (2019) found a deteriorated credit culture in Zimbabwe contributed in nationwide rise of non-performing loan. KOLAPO *et al.*, (2012) studied effect of credit risk on banks' profitability and found both nonperforming loan and loan loss provision has significantly reduced profitability of banks. In Malaysia, a research was conducted to evaluate the influence of living standard, economy, income, and bank interest rate on non-performing loan. The results found that except living standard all other factors significantly influence non-performing loan. (Murthy *et al.*, 2017).

Barasa & Njuguna, (2017) investigated and found an affirmative and significant relationship between loan appraisals with NPL. Karsh & Abumwais, (2017) studied the strategies of credit risk analysis used by commercial banks of Palestine and found that banks there uses 5Cs, LAPP, past experience, 5Ps and financial analysis in the respective sequence of priority.

Several studies in Bangladesh evaluated the non-performing loan and its effects. A study conducted on commercial and specialized banks in Bangladesh concluded that non-performing loan significantly influence return on assets (Islam *et al.*, 2015). Zaman, (2020) explored the condition of non-performing loan and recovery in a northern division of Bangladesh and found that state run commercial banks are worst affected by the NPL compared to private commercial banks. Kumar *et al.*, (2020) studied the trend of non-performing loan in Bangladesh and found the level of NPL is increasing over the years; the commercial banks in the country are crippled with 5 to 6 times higher NPL than international standard.

Studies on credit risk analysis methods lack a comparison among the conventional methods. In addition, the perception of industry professionals was never evaluated in earlier studies in the area. In Bangladesh, a handful of studies were conducted

on credit risk analysis and non-performing loan. However, most of the studies lack appropriate use of statistical tools. Therefore, an absence of knowledge in the area is evident from literature review.

3. Hypothesis

The following hypothesizes will be tested in the study:

1. 5 Cs of credit analysis method is significantly effective in identifying non-performing loans for commercial banks.
2. LAPP credit analysis method is significantly effective in identifying non-performing loans for commercial banks.
3. 5Ps of credit analysis method is significantly effective in identifying non-performing loans for commercial banks.

4. Methodology

The research used primary data by a structured questionnaire. The data was collected from 103 professional bankers around Sylhet region by pursuing them individually via online form. A Google form containing the questionnaire was sent to bankers to be filled up. The data was collected in the year 2020 and convenience sampling method was used to conduct the survey. In Table 1, the demographic profiles of the respondents are given:

Gender		Age	
	%		%
Male	45.2	Below 20 years	0
Female	54.8	20-30 years	18.5
		31-40 years	81.5
Type of Bank		%	
		State Owned Commercial Banks	12.15
		Conventional Private Commercial Banks	69.16
		Islamic Private Commercial Banks	14.00
		Foreign Commercial Banks	4.67

3.1. Measurement Variables

In this study, the respondent bankers evaluated the effect of three methods of credit analysis (Dependent Variables: 5 Cs, 5 Ps and LAPP) on non-performing loan conditions (Independent Variable) in their respective banks. The four variables were measured several statements with likert scale method (1=strongly disagree; 5= strongly agree).

The respondents rated effectiveness of the factors used in the three credit analysis methods. The 5Cs method uses five factors- Character, Capability, Condition, Collateral, and Capital. The 5Ps method uses five factors- People, Product, Payment, Perspective, and Protection. Finally, the LAPP method uses four factors- Liquidity, Activity, Profitability, and Potential. On contrary, the independent variable non-performing loan performance was evaluated on the basis of five statements that measures rate of loan repayment, percentage and growth of non-performing loan, tendency of credit client to be loan defaulter and punctuality in payment.

To test the hypothesis, multiple linear regression analysis was used with the help of SPSS 23 software package.

4. Model Development

On the basis of the previous assumptions, the following statistical model was developed:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i$$

Where,

Y_i is the Non Performing Loan for i ;

β_0 is the intercept;

β_1 is the regression coefficients for 5 Cs of Credit Analysis Method;

β_2 is the regression coefficients for 5 Ps of Credit Analysis Method;

β_3 the regression coefficients for LAPP of Credit Analysis Method;

X_{1i} is the independent variable 5 Cs of Credit Analysis Method for i ;

X_{2i} is the independent variable 5 Ps of Credit Analysis Method for i ;

X_{3i} is the independent variable LAPP of Credit Analysis Method for i ;

ε_i is the residual variation for i .

5. Analysis and Findings

At first the preliminary assumptions of multiple linear regression were tested to justify the use of this analysis. In the beginning, the normality test was conducted by verifying the Q-Q plots and histogram given in appendix (Ghasemi & Zahediasl, 2012). In addition, the skewness and kurtosis of the independent variable- NPL were -.457 (SE=.238) and 1.924 (.472); acceptable to confirm normality (Gravetter & Wallnau, 2014). Subsequently, the absence autocorrelation was verified with Durbin-Watson test, which accepts a score ranging from 1.5 to 2.5 to conform the state of absence of autocorrelation (Durbin & Watson, 1950). The score for the test is 1.806, which satisfied the assumption. Furthermore, the correlation value in table 2 was used to check the linear relationship among dependent and independent variables. To institute the requirement of homoscedasticity, the scatterplot between the Regression Standardized Residual and Regression Standardized Predicted Values showed values around within +3 to -3 range, given in the appendix (Pryce, 2002). As a final point, tolerance value more than .1 and VIF values less than 10 confirmed the validation of multicollinearity (Hill & Adkins, 2001).

Table 2: Descriptive and Correlations

	Mean	Std. Deviation	NPL	5Cs	5Ps
NPL	3.1767	.47552			
5Cs	3.2252	.49601	.303**		
5Ps	2.8214	.51405	.236**	.565***	
LAPP	3.0218	.53218	.498***	.486***	.496***

Note. ** $p > 0.05$, *** $p < 0.001$

6. Test of Hypothesis

According to bankers, the three credit risk analysis methods can predict only 25.5 % of the non-performing loan cases in banks with a R^2 value of .255. Whereas, Falk & Miller (1992) recommended a R^2 value of greater than .10 is adequate for model fit. This finding is also significant in the sense that bankers perceived around 75% of factors influencing non-performing loan performance is included in the study.

Table 3: Test of Hypothesis

Hypotheses	Standardized Coefficients	Sig.	Result
H1	5 Cs of credit analysis method is significantly effective in identifying non-performing loans for commercial banks		
	.11	.338	Rejected
H2	LAPP credit analysis method is significantly effective in identifying non-performing loans for commercial banks		
	.48	.000	Accepted
H3	5Ps of credit analysis method is significantly effective in identifying non-performing loans for commercial banks		
	-0.20	.589	Rejected

To evaluate the hypothesis, multiple regression analysis was used. First assumption was 5 Cs of credit analysis method is significantly effective in identifying non-performing loans four commercial banks. But the results from the regression analysis suggest that banker perception does not support the assumption. The hypothesis that 5 Cs of credit method is significantly effective in identifying non-performing loans is rejected with, $\beta = .11$, $p = .33$. It indicates using 5Cs credit analysis method is 11% effective in improving non-performing loan performance, but the effect is not statistically significant. Therefore, a banker of commercial banks in Bangladesh finds the method significantly ineffective in measuring credit risk in term of tracking potential non-performing loans.

Secondly, the assumption was LAPP credit analysis method is significantly effective in identifying non-performing loans for commercial banks. Bankers' perception supports the hypothesis. With $\beta = .48$, $p < .001$, the hypothesis that LAPP credit analysis method is significantly effective in identifying non-performing loans is accepted. The result suggests that LAPP method is 48% effective in improving non-performing loan performance in Bangladesh and the finding is statistically significant. Hence, Bankers consider the method significantly effective in developing non-performing loan performance.

Finally, 5Ps of credit analysis method is significantly effective in identifying non-performing loans for commercial banks. But the results of multiple regressions did not support the hypothesis. With $\beta = -.20$, $p = .589$; the hypothesis that 5Ps of credit analysis method is significantly effective in identifying non-performing loans is rejected. It indicates that the

implementation of this reduces the performance of non-performing loan in banks, but the result is statistically insignificant. Therefore, bankers ponder the method ineffective in improving non-performing loan performance.

Among the credit risk analysis method, bankers assumed that 5Cs and LAPP method improves the performance of non-performing loan, but they suggested only LAPP method is significant enough in improving the non-performing loan. On the other hand, they prescribed the use of 5Ps as a factor reducing non-performing loan performance. The findings contradict earlier studies which preferred the use of 5Cs over the LAPP and 5Ps method (Karsh & Abumwais, 2017). The results also suggested not all of the methods of credit risk analysis is significant in improving loan performance, thus opposing earlier study (Barasa & Njuguna, 2017).

Future studies can include other credit risk analysis methods to evaluate the performance in controlling non-performing loans. The studies can also evaluate other prospective factors influencing non-performing loan performance.

7. Conclusion

Credit risk analysis is critical in identifying bad loans in banking sector. Banks uses a variety of models to evaluate the credit risks of each proposed loans. But not every technique is equally effect in identifying the prospective bad loans. This study assesses the credibility of 5Cs 5Ps, and LAPP methods of credit risk analysis from the perspective of bankers in Bangladesh. Bankers assume that the LAPP method is effective in identifying bad loans in the sector. On contrary, 5Cs and 5Ps method are not statistically significant in improving nonperforming loan performance.

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Appendix

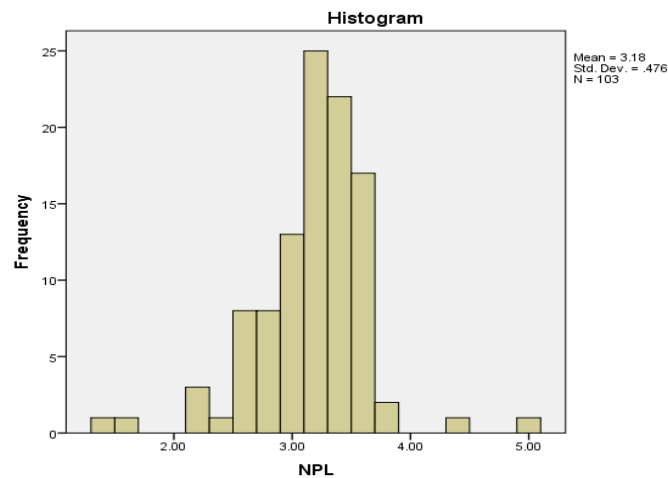


Figure: Histogram of Non-performing loan

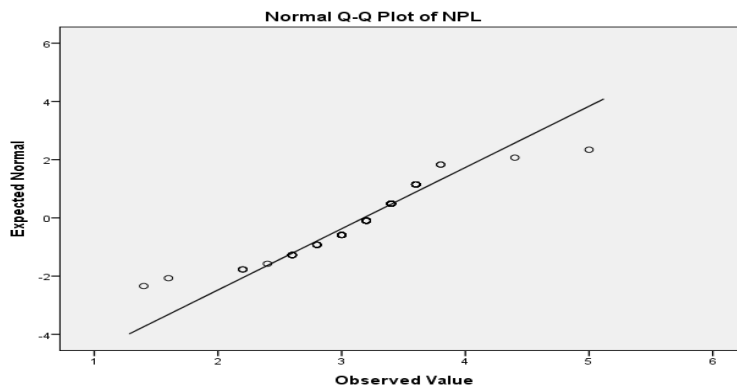


Figure: QQ plot of Non-performing loan

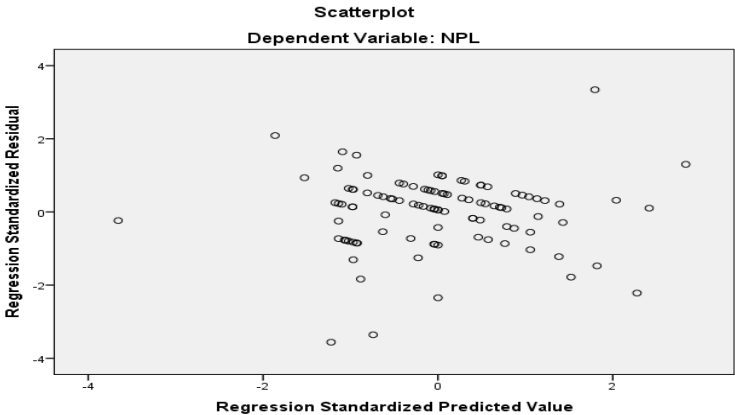


Figure: Scatter plot between Regression Standardized Residual and Regression Standardized Predicted Value