An Analysis of Credit Risk Impact on Loan Performance - Evidence from Selected Commercial Banks

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Abstract: *The purpose of the study is credit risk impact on loan performance in selected commercial banks in Ampara District of Sri Lanka. Census sampling technique was used because all branch managers and credit officers were directly targeted in this study. Questionnaire was used to collect data and 50 respondents were collected comprising of all the technical staff including managers from commercial banks in Ampara District. A descriptive, multiple regression and correlation analysis were carried out to investigate the relationship between loan appraisal, credit rating, financial viability, technical feasibility, risk transfer, risk diversification, risk retention with loan performance. This research shows that, loan appraisal, credit rating, financial viability, technical feasibility, risk transfer, risk diversification, risk transfer had a no significant relationship but relationship with loan performance. The study recommends adoption of a more stringent policy on credit risk management in commercial bank is required as to improve their loan performance.*

Keywords: *Risk Management, Credit, Loan Performance, Commercial Bank*

Introduction

Financial organizations are playing a major role in economic growth as they are assembling savings for fruitful investments through assisting capital flows towards diverse sectors of the economy (Shanmugan & Bourde, 1990; Sufian & Parman, 2009). The importance of banks in a financial system cannot be get rid of as they are the establishments, provide liquidity for both lender and borrower (Kashyap et al., 1999). Further, Greuning, H., Bratanovic, S.B. (2003) mentioned that the commercial banks in most of the world economies are leading as a financial association offering installment loans compared to any other financial institution.

The concept of Credit Risk Management can be treated as the heart of any commercial bank. It plays the vital role in the performance of a financial institution as it analyzes credit worthability of borrowers. If there is any gap in credit risk assessment, then recovery of the provided loans and advances is challenged greatly. As a whole, profitability falls in a great uncertainty. A bad loan often arises from different factors or combination of factors, but the most important reason is the absence of proper loan classification system. It can identify problem loans immediately and take necessary steps to minimize potential defaults and consequent losses. Said, R. M., & Tumin, M. H. (2011) stated that the banks are the critical part of financial system and play a vital role in a country's economic development. Due to the US sub-prime mortgage crisis, the banking sectors of many countries suffered huge losses, especially in the US and the EU. Poor performance of the banking industry has slowed down the US economy and also the growth of global economy.

R. M., & Tumin, M. H. (2011) highlighted that, in Asia, although the losses in banking sectors are not as serious as in the US, it is also hurting the economy. Rufai, A. S. (2013) stated that adequately managing credit risk in financial institutions is critical for the survival and growth of the financial

institutions. In the case of banks the issue of credit risk is of even of greater concern because of the higher level of perceived risks resulting from some of the characteristics of clients and business conditions that they find themselves in. Abiola, I., &Olausi, A. S. (2014) declared that the credit risk management in banks has become more vital not only because of the financial crisis but also a crucial concept which decide banks' survival, growth and profitability.

Gorton, G. B., & He, P. (2008) stated that bank determines whether potential borrowers are creditworthy, whether they meet the bank's credit or lending standards, so each bank is in rivalry with other banks, but without knowing the competitor banks' credit standards. Casey, K. M., et al (2009) highlighted that measuring credit risk, both pre-loan and post-loan, is a significant step in reducing both loan delinquencies and loan defaults. There are previous studies which address the impact of credit risk on loan performance in various aspects.

For instance, Abiola, I., &Olausi, A. S. (2014) conducted research to investigate the impact of credit risk management on the performance of commercial banks in Nigeria using seven commercial banking firms with seven years data (2005 – 2011). They used the Return on Equity (ROE) and Return on Asset (ROA) as the performance indicators while Non-Performing Loans (NPL) and Capital Adequacy Ratio (CAR) as credit risk management indicators. Theyfound that credit risk management has a significant impact on the profitability of commercial banks' in Nigeria. Ahmed, S. F., & Malik, Q. A. (2015) studied to assess the influence of credit risk management practices on loan performance with the credit terms and policy, client appraisal, collection policy and credit risk control as the dimensions of the credit risk management practices in Pakistan.

More over Gizaw, M., Kebede, M., &Selvaraj, S. (2015) found that the credit risk measures: non-performing loan, loan loss provisions and capital adequacy have a significant impact on the profitability of commercial banks and suggested it is required to improve credit risk management to keep the existing profitability of commercial banks in Ethiopia. The rest of the paper is organized as follows. In the following section illustrates the literature review, research questions, objectives, methodology, empirical analysis and findings, discussion and conclusion respectively

Literature Review

Cipovová, E., &Belás, J. (2012)mentioned that due to the recent situation on the market, worldwide banking industry is facing the need to effectively manage credit risk by techniques for credit risk management. Cipovová, E.,& Belás, J. (2012) stated that the banks implements modern methods of risk management to their system not just because of the new regulatory agreement, but also because of increasing competition, which is forced to introduce better internal methodologies and processes. Berkovec, J. A., et al (1998)suggested that various social, economic, and cultural differences may correlate with racial and ethnic differences. But this study not only in studies of loan performance, but also in studies of acceptances and rejection of mortgage applications.

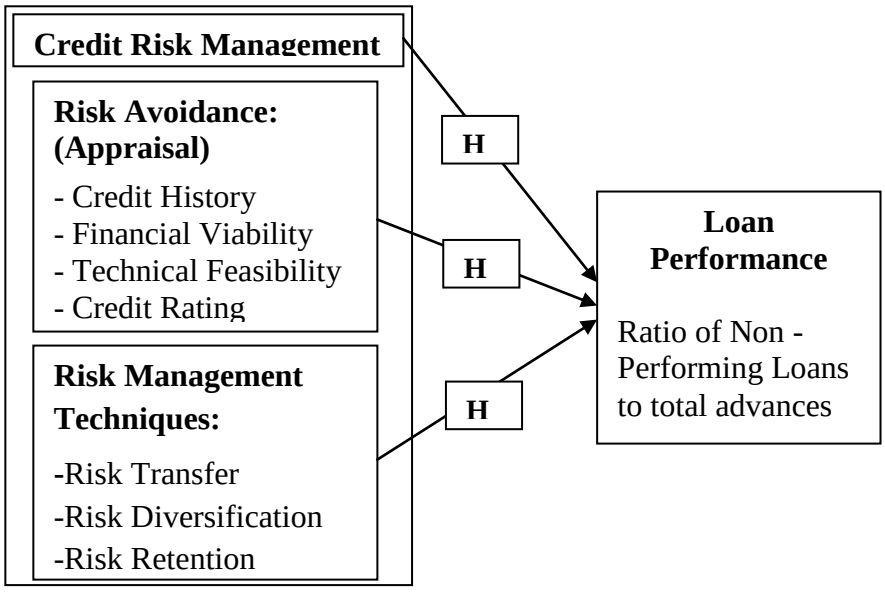
Berkovec, J. A., et al (1998) studied in the mortgage lending that the local market concentration to proxy the competitive environment the prediction of better loan performance by minority borrowers relative to white borrowers in more concentrated markets. Edelstein, R. H. (1975)conducted a research in improving the selection of credit risks with the research question as the differentiation between potentially good and potentially bad credit risks. Katchova, A. L., & Barry, P. J. (2005) used credit value-at-risk methods to analyse probability of default, loss given default, and expected and unexpected losses by applying two models thus, Credit Metrics and Moody's KMV. They found that the necessary capital for agricultural lenders it varies significantly depending on the riskiness and granularity of the portfolio. Glennon, D., & Nigro, P. (2005)found by applying a discrete-time hazard framework, the probability of default is provisional on borrower, lender, and loan characteristicsand changes in economic conditions.

Ericsson, J., & Renault, O. (2006)developed structural bond valuation model to capture liquidity and credit risk and found that there is a positive correlation between the illiquidity and default components of yield spreads.Carty, L. V. (2000)identified the deviations in default risk with macroeconomic conditionswith industries, and throughtimean important depiction for

manyapproaches to measuring and managingcreditrisk. Gorton, G. B., & He, P. (2008) stated that the relative bank performance of commercial and industrial loans is a self-directed source of macroeconomic fluctuations and the relative bank performance is a priced risk factor for both banks and non-financial firms.

Malik, M., & Thomas, L. C. (2010) found that the default intensities of consumers are significantly influenced by macro factors and which can be used as the root for the simulation approaches to estimate the credit risk of portfolios of consumer loans. Ahmed, S. F., & Malik, Q. A. (2015) found that the credit terms and client appraisal have positive and significant impact on the loan performance, on the other hand collection policy and credit risk control have positive but insignificant impact on loan performance in Pakistan. There are several theatrical models which address the credit risk for instance, *5Cs model* of credit management to evaluate a customer as a potential borrower. The 5Cs are character, capacity, collateral, capital and condition. *Portfolio Theory* companies have successfully applied modern portfolio theory to market risk. *Arbitrage Pricing Theory (APT)*approach moved away from the risk vs. return logic and exploited the notion of pricing by arbitrage to its fullest possible extent and *Information Theory thus* borrowers should be screened especially by banking institutions in form of credit assessment.

Conceptual Framework



Source: McNaughton et al, (1996).

Figure 01: Conceptual Framework

The model above explains the relationship between credit risk management and loan performance as developed by McNaughton, et al (1996). The two components of risk management namely: Appraisal and Risk Management Techniques. If these components are properly applied in a financial institution, that will lead to loan performance.

Hypotheses

According to the above developed conceptual framework, the researcher developed hypothesizes as follows.

H_1- There is no significant relationship exist between loan appraisal and loan performance in the selected commercial banks.

H_2- There is no significant relationship exist between risk management techniques and loan performance in the selected commercial bank.

H_3- There is no significant relationship exist between credit risk management and loan performance in the selected commercial bank.

Independent Variables

There are mainly two components of credit risk have taken under this independent variables. According to the model, credit risk is divided into two components firstly *Risk Avoidance (Appraisal)*: it has four elements such as credit history, financial viability, technical feasibility and credit rating. Secondly *Risk Management Techniques*: it has three elements namely; risk transfer, risk diversification and risk retention.

Dependent Variable

Under the dependent variable the element loan performance has an indicator like ratio of Non-Performing Loans (NPL) to total advances. NPL can be calculated as follows:

Non - Performing Ratio **(NPL)** =

Non Performing advances X 100
Total loan portfolio

Research Question

The research question for this research is stated as follows.

i. Is there any relationship exist between loan appraisal (avoidance) and loan performance in the selected banks?

ii. Is there any relationship exist between risk management techniques and loan performance in the selected banks?

Objectives of the Research

The researcher developed the objectives of this research keeping the research problem in mind. The objectives are as follows.

i. To examine the relationship between loan appraisal (avoidance) and loan performance.

ii. To examine the relationship between risk management techniques and loan performance

Methodology

The population for this study is all commercial banks in Sri Lanka. According to the Central Bank of Sri Lanka (CBSL), as at end of2014 there are 25 licensed commercial banks operate in Sri Lanka with 9 licensed specialized banks. For the purpose of the study a sample of 14 banks were taken. **Appendix 01** shows sample of banks and issued, collected questionnaire from respondents. Data were collected from 42 Credit Officers including managers of each bank from Licensed Commercial banks with a credit related function and 08 from licensed specialized banks. The total sample size was selected for interview 50. Purposive sampling method was used because only Managers and Credit Officers were targeted to respond to the questionnaire.

The measure for loan performance (dependent variable) was Non- Performing Loans Ratio (NPLR)calculated as Non-performing Loans/Total Loans. The ratios of NPL were taken through depth interviews with managers of each selected banks. The components of the appraisal and the components of other risk management techniques being treated as credit risk management were placed on a five- point Likert scale ranging from strongly agree - 5,Agree - 4, Uncertain - 3, Disagree - 2, and Strongly Disagree - 1 in form of statement.

Questionnaire consists of three sections: section one consist general information of respondent which investigates the demographic information of respondents, such as gender, age, education level, and working experience in credit department. Section two consist the elements of the appraisal namely; credit history, technical feasibility, financial viability, and credit rating. The section three consists the components of other risk management techniques namely; risk transfer, risk diversification, and risk retention.

Data Analysis

Data were analyzed by using Statistical Package for Social Science (SPSS) 16.0. Descriptive statistics, Reliability analysis, Correlation, and Regression

analysis were conducted through the data analysis process. Pearson's correlation coefficient was used to determine the strength of relationships between the two variables i.e. credit risk management and loan performance. On the other hand, the dependent variable (loan performance) was measured using ratio analysis i.e. the ratio of non - performing loan to total advances.

Statistical Model

To derive the appropriate conclusion to the study the dependent variable (loan performance) was tested against the three main independent variables using multiple regression. The factors of are β (independent variables) and dependent variable is Y. The regression model was established using the equation as follows:

$$\mathbf{Y= \beta_0+ \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + e}$$

Where,

Y= dependent variable

β_0= regression constant

β_1, β_2,and β_3 are the beta coefficient (slopes of the regression equation) and Independent variables are X_1, X_2 andX_3

eValue -is an error term normally distributed about a mean of 0 and for purpose of computation, the ϵ is assumed to be 0.

Where, NPL= Non – Performing loan, CRM = Credit Risk Management, RMT= Risk Management Technique, RA= Risk Appraisal

According to above equation following model was established for this research study.

$$\textbf{Model} \longrightarrow \mathbf{NPL = \alpha\ \beta_1CRM+\beta_2RMT+\beta_3RA + e}$$

Results and Discussion of Findings

Correlation Analysis Between Variables

Appendix 03 shows the Pearson Correlation - r with their P-value as follows. The correlation about the sub variables of major variable thus Risk Avoidance: (Appraisal) as follows. This research shows that there was not a significant but positive relationship between credit history (CH) with the ratio of non- performing loans (NPL) to total advances (r = 0.350, P- value= 0.220 > 0.05). There was not a significant but weak positive correlation exists between financial viability (FV) and the relationship between ratio of non - performing loans (NPL) to total advances (r = 0.143, P – value= 0.625 > 0.05). There was not a significant positive correlation but negative weak correlation exists between technical feasibility (TF)and non - performing loans (NPL) to total advances ratio (r = -0.292, P–value= 0.311> 0.05) and there was also not a significant but it is a weak positive correlation exists between credit rating (CR) with ratio of non – performing loan (NPL) to total advances (r = 0.079, P – value= 0.787 > 0.05).

The correlations about the sub variables of major variable Risk Management Techniques as follows. There was not a significant but weak positive relationship exists between risk transfer (RT) with non- performing loans (NPL) to total advances (r = 0.172, P-value= 0.558> 0.05). There was not a significant weak correlation exists between risk diversification (RD) and non – performing loans(NPL) to total advances (r = 0.132, P-value= 0.654> 0.05).There was not a significant but weak positive relationship exists between risk retention (RRA) with non-performing loans (NPL) to total advances (r = 0.161, P-value= 0.582>0.05).

Summary of correlation between Risk Appraisal, Risk Management Techniques and Credit Risk Management with Loan Performance are as follows. This research shows that there is no statistically significant correlation but weak positive correlation exist between Risk Appraisal and the relationship between ratio of non - performing loans to total advances (r = 0.99, P value= 0.736 > 0.05). This research shows that there is not statistically significant correlation but a positive weak relationship exist between Risk Management Techniques and ratio of non - performing loans to total advances (r = 0.187, P value= 0.521 > 0.05). This research shows that there is not a statistically significant correlation but weak positive correlation exist between Credit Risk Management and the ratio of non- performing loans to total advances (r=0.218, P value=0.453>0.05).

Table 01: Summarized of correlation among major variables

Correlations

		NPL	RA	CRM	ORM
NPL	Pearson Correlation	1	.099	.218	.187
	Sig. (2-tailed)		.736	.453	.521
	N	14	14	14	14
RA	Pearson Correlation	.099	1	.637**	.338*
	Sig. (2-tailed)	.736		.000	.016
	N	14	50	50	50
CRM	Pearson Correlation	.218	.637**	1	.447**
	Sig. (2-tailed)	.453	.000		.001
	N	14	50	50	50
RMT	Pearson Correlation	.187	.338*	.447**	1
	Sig. (2-tailed)	.521	.016	.001	
	N	14	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Multiple Regression Analysis Results

Table 4.5:Coefficients of multiple regression analysis between NPL and CRM,RMT and RA

The multiple regression statistical model can be derived as follows.

$Y= \beta_0+ \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + e$

NPL= 6.89 + 0.197(CRM) + 0.025 (RMT) + 0.003 (RA)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.890	1.848		3.729	.004
	CRM	.021	.058	.197	.362	.725
	RMT	.001	.019	.025	.046	.965
	RA	.000	.016	.003	.008	.994

a. Dependent Variable: NPL

As shown in the multiple regression equation above holding credit risk management, risk management techniques and risk appraisal, loan performance in commercial banks would be 6.89. It was found out that a unit increase in credit risk management in commercial banks would cause an increase in loan performance by 0.197. A unit increase in risk management techniques in commercial banks would cause an increase in loan performance by 0.025 and also a unit increase in credit risk management in commercial banks would cause an increase in loan performance by 0.197. This shows that there is a positive relationship between loan performance of commercial banks and credit risk management, risk management techniques and risk appraisal in the selected commercial banks in Sri Lanka. In the above table the Coefficients having p-values less than alpha are statistically significant. Thus none of the P values for CRM, RMT and RA is less than 0.05. therefore, none of these is statistically significant.

Hypothesis testing

H_1 - There is a no significant relationship between loan appraisal and loan performance in the bank selected commercial banks.

This research shows that the r = 0.99, P value 0.736 > 0.05,as a result cannot reject Ho. Therefore it can be statistically concluded that at 5 % significant level there is no significant relationship exist between loan appraisal and loan performance in the commercial bank in Ampara district.

H_2 - There is a no significant relationship between risk management techniques and loan performance in the selected commercial bank.

This research shows that the r = 0.187, P value 0.521 > 0.05, as a result cannot reject Ho. Therefore it can be statistically concluded that at 5 % significant level there is no significant relationship exist between Risk Management Techniques and ratio of non - performing loans to total advances in the commercial bank in Ampara district.

H_3- There is a no significant relationship between credit risk management and loan performance in the selected commercial bank.

This research shows that the r = 0.218, P value 0.453>0.05, as a result cannot reject Ho. Therefore it can be statistically concluded that at 5 % significant level there is no significant relationship exist between Credit Risk Management and ration of non - performing loans to total advances in the commercial bank in Ampara district.

Limitations of the Research

This research study only focused credit risk in the selected commercial banks in Ampara district of Sri Lanka. It is obvious that, other types of risks also such as liquidity risk and market risk highly influencing the loan performance and needs to be addressed extensively in banking sector. Further, this particular research was carried out in Ampara district specially, costal belt of this district. There were only 14 commercial banks were considered and 50 banking professional considered for the data collection purpose.

Conclusion

Credit provision needed appropriate attention as credit risk management is one of the vital aspects and has become a hot issue in the banking industry. The risk management is not only essential for sustainability but also for the development of banking sector as well. This research reveals that there is no significant relationship but relationship exist between risk appraisal, risk management techniques, credit risk management and ratio of non - performing loans to total advances in the selected commercial bank in Ampara district. Further the multiple regression analysis shows none of the independent variable is statistically significant. Since there is no significant relationship shown between risk appraisal and loan performance, it requires the improved measures in lending loan to enhance their risk appraisal. Through risk appraisal, the banks will be able to know credit worthiness of clients and thus reduce non-performing loans. Further, it is important for the bank to formulate an appraisal procedure, format that details ways of capturing all the credit risk. This should guide in selection of technique or combination of techniques to handle each exposure. Further risk management techniques had no significant relationship with loan performance. Under this risk transfer, risk diversification and risk retention are part of the variables which are given same results. Hence, it is recommended to use insurance firms certain extent to transfer or share risk in case of default. It is also important for the bank to start practicing advanced hedging methods for example use of derivative products like swaps, option, and futures. Moreover, Diversification of loan portfolio should be part and partial of banks policy in a bid to spread risk. Loan portfolio should be invested in different sectors, regions. Diversification should also be done across nations where the benefits are much stronger than when diversification occurs across sectors. And also, risk retention is needed to the banks indicate that risk retention analysis should be never an ending process as banks constantly decide how much risk to retain. Hence use of credit rating models should continuously be applied. This will help to the commercial banks in Ampara District to ascertain how much interest rate to charge for a given loan as it summarize and quantify risk in a given loan portfolio. Moreover this research could be improved by adding more dimensions of credit risk management practices and by increasing more sample size would add more generalizability to the current findings. Moreover the secondary sources of the data also would be integrated for the better explore the impact of credit risk in the loan performance.

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Appendix 01:

Table 3.3: Sample of banks and issued, collected questionnaire from respondents

Serial No	Name of Bank	Issued Questionnaire for Respondents	Collected Questionnaire from Respondents
1	People's bank	7	4
2	Bank of Ceylon	6	4
3	Sampath Bank PLC	7	6
4	Hatton National Bank	4	3
5	Amana Bank Ltd	7	6
6	Commercial Bank of Ceylon PLC	7	4
7	Habib Bank Limited	5	3
8	Seylan Bank PLC	4	3
9	National Savings Bank	3	3
10	Nation Trust Bank	5	3
11	National Development Bank PLC	5	3
12	DFCC Vardhana Bank PLC	4	3
13	Sanasa Development Bank PLC	3	2
14	Regional Development Bank	3	3
	Total	**70**	**50**

Appendix 02: Model Summery of Multiple Regression Analysis between NPL and CRM, RMT, RA

Model	Dependent	Independent	R	R Square	Adjusted R Square	F-Value	Significant value
01	NPL	CRM RMT RA	0.219	0.048	- 0.238	0.168	0.916

Appendix 03 :

Correlations

		NPL	CH	FV	TF	CR	RT	RD	RRA
NPL	Pearson Correlation	1	.350	.143	-.292	.079	.172	.132	.161
	Sig. (2-tailed)		.220	.625	.311	.787	.558	.654	.582
	N	14	14	14	14	14	14	14	14
CH	Pearson Correlation	.350	1	.153	.490**	.558**	-.055	.200	.140
	Sig. (2-tailed)	.220		.289	.000	.000	.702	.163	.333
	N	14	50	50	50	50	50	50	50
FV	Pearson Correlation	.143	.153	1	.385**	.464**	.467**	.292*	.418**
	Sig. (2-tailed)	.625	.289		.006	.001	.001	.040	.002
	N	14	50	50	50	50	50	50	50
TF	Pearson Correlation	-.292	.490**	.385**	1	.605**	-.141	.056	.110

	Sig. (2-tailed)	.311	.000	.006		.000	.329	.700	.447
	N	14	50	50	50	50	50	50	50
CR	Pearson Correlation	.079	.558**	.464**	.605**	1	.329*	.435**	.376**
	Sig. (2-tailed)	.787	.000	.001	.000		.020	.002	.007
	N	14	50	50	50	50	50	50	50
RT	Pearson Correlation	.172	-.055	.467**	-.141	.329*	1	.454**	.664**
	Sig. (2-tailed)	.558	.702	.001	.329	.020		.001	.000
	N	14	50	50	50	50	50	50	50
RD	Pearson Correlation	.132	.200	.292*	.056	.435**	.454**	1	.461**
	Sig. (2-tailed)	.654	.163	.040	.700	.002	.001		.001
	N	14	50	50	50	50	50	50	50
RRA	Pearson Correlation	.161	.140	.418**	.110	.376**	.664**	.461**	1
	Sig. (2-tailed)	.582	.333	.002	.447	.007	.000	.001	
	N	14	50	50	50	50	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).