IMPACT OF CREDIT RISK MANAGEMENT ON PROFITABILITY OF COMMERCIAL BANKS OF SRI LANKA FROM 2014 TO 2017

Ranasinghe, R.A.P.D (pumudil123@gmail.com)

Udawatta, M.D

Jayasanka, K.D

Peiris, P.P.L

Nanayakkara, G.D.K.D

ABSTRACT

Banks are an essential component in the economy in the process of creating economic growth in both developed and developing countries. In order to contribute to its commitment to promote growth, banks should be able to lock in on the stability of their financial performance. However, this is not an easy task given the highly competitive business environment. Banks today face various risks that may affect its ability to maintain a strong financial performance (Saiful, 2017). In the context of financial institutions, the primary risk of concern is the risk of credit, which has a profound impact on the banking sector and its profitability. Hence, aim of this study is to analyze the impact of credit risk management practices on profitability of licensed commercial banks.

The research takes on a quantitative approach and will be based on an analysis of secondary data. The primary source of data for the study will be annual reports of licensed commercial banks in Sri Lanka. The cross sectional analysis will be based on four indicators; Return on Assets (ROA), Return on Equity (ROE), Non-Performing Loan Ratio (NPLR) and Capital Adequacy Ratio (CAR). ROA and ROE will be used as quantitative indicators of profitability of commercial banks, while NPLR and CAR will be used as credit risk management indicators. The credit risk in this context refers to the risk of default on banks assets, mainly loans and advances.

Key Words

Credit Risk Management, Profitability, Licensed Commercial Banks

1. INTRODUCTION

1.1. Background of the study

The risks that are most applicable to banks; credit risk, interest rate risk, liquidity risk, market risk, foreign exchange risk and solvency risk are always considered in the context of risk management. Credit risk, which tends to be the primary focus of any risk management approach in a commercial bank, is the risk of loss due to debtors' non-payment of a loan or a line of credit (either the principal, interest or both). With the banking systems increased involvement in all aspects of a modern economy, the impact of credit risk on a bank's profitability has been the focus of many researchers of the likes of Kolapo, Ayeni and Oke (2012), who evaluated the impact of credit risk on the profitability of Nigerian banks. According to the findings, credit risk management has a significant impact on the profitability of banks.

1.2. Significance of the study

Poudel (2012) noted that insight gained from research already conducted on the relationship between risk management and profitability of commercial banks in other parts of the world have been modeled to help improve the resilience and motivation for better risk management in those institutions. This study aims to fill the gap between literature and empirical evidence about the impact of credit risk management on profitability of commercial banks in Sri Lanka. Hence the research will contribute to understanding and developing policies in the banking sector of Sri Lanka.

In addition, it will be useful to commercial banks of the country to assess their credit risk controlling techniques in order to reduce non-performing loans and be profitable and more liquid than before. It will be also useful and add knowledge for those who are working on credit risk environment to identify the impact of credit risk management towards the performance of the banks. Further, the findings of this study will assist policymakers and bankers to understand the impact of credit risk management on the bank profitability. This study will also assist risk management officers in their strategic planning process. This study is important for the investors and shareholders who invest in banks so that they can get knowledge regarding risk and return to maximize their wealth and decision-making process. The research is also important from a

2

customer's perspective, because they can get knowledge about bank stability and capability of their business operation activities that will help the individual banks to identify the shortcomings and strengths of their credit risk management practices. Finally, bank supervisors, such as central banks and securities commissions will be provided more evidence for the impact of credit risk management and to investigate if it is necessary to deregulate or impose further regulation.

1.3 Problem Statement

In order to acquire an understanding of the impact of credit risk management and profitability of commercial banks, authors formulated the following research question:

What is the relationship between credit risk management and profitability of commercial banks in Sri Lanka from 2014 to 2017?

1.4 Research objectives

The objective of the research is to identify the *relationship between credit risk management and profitability of commercial banks in Sri Lanka from 2014 to 2017*

- Was there statistically significant relationship between the credit risk management and profitability of commercial banks in Sri Lanka from 2014 to 2017

1.5 Specific Objectives

The objectives of the Research are to identify:

- Whether there is a relationship between credit risk management and profitability of commercial banks in Sri Lanka
- Whether the relationship between the credit risk management and profitability of commercial banks in Sri Lanka is positive or negative.
- Statistical strength and variance of the relationship between credit risk management and profitability of commercial banks in Sri Lanka.

2. LITERATURE REVIEW

As large financial institutions, commercial banks face many potential sources of risk, including liquidity risk, credit risk, interest rate risk, market risk, regulatory risk, foreign exchange risk and political risks (Campbell, 2007). However, credit risk is the most important risk all financial institutions are exposed to (Gray, Cassidy, & RBA., 1997). Credit risk is the risk that a borrower

defaults and does not honour its obligation or is delinquent to service debt. The indicators of credit risk include the level of non- performing loans, problematic loans or provision for loan losses (Jimenez & Saurina, 2006).

Hakim and Neaime (2005) notes that credit risk variable is a good predictor of profitability across all banks in their study of banking systems in Lebanon and Egypt. The study shows that a high ratio of loans to assets shows banks commitment to additional risk and should result in an increased profitability, so far as higher assumed risk results in higher return. The study also suggested that liquidity risk is insignificant across all banks and seems to have no statistically significant relationship with profitability.

Various researchers have studied the impact of credit risk management on bank profitability and pointed out that there is a statistically significant relationship between credit risk management and bank profitability. Li & Zou (2014) found that there is a significant and positive relationship between credit risk management and bank profitability in Europe. Furthermore, an investigation has been conducted on credit management on bank performance for the Nigerian banking industry by Kolapo, Ayeni and Oke (2012). Findings suggest that close to 78% of the movement in Return on Assets could be explained by the joint variation in the independent variables considered; Non-performing loans, loans and advances, loan loss provision, classified loans and total deposits.

Ndoka & Islami (2016) point out that if NPL increases by 1 unit, profitability as measured by ROA will reduce by 0.2869 units and the variable ROE by 0.018582 units. Accordingly, findings suggest that banks should enhance credit analysis of the borrower's capacity and the process of loan administration. It was also found that high NPL affects the bank profitability and they should be monitored periodically.

Poudel (2012), in his study of the impact of credit risk management on financial performance of commercial banks in Nepal has assessed various parameters related to credit risk management and their impact on the banks' bottom line. Data from 31 banks over a period of eleven years (2001-2011) was analysed by contrasting profitability measures against default rate, cost of per loan assets and capital adequacy ratios. It was concluded in the study that all studied parameters have a negative impact on banks financial performance.

Kodithuwakku (2015) in her study of 100 banking staff members from selected banks in Sri Lanka reports that 69% of the bankers' agreed that the main purpose of having a credit risk management framework as reducing financial losses. Further the research showed that 100% of bankers' have opted to have a separate committee to lead their credit risk management process. Also, respondents recognized board's commitment is necessary to mitigate and address losses due to credit risk.

Charles and Kenneth (2013) in their investigation of the impact of credit risk management on capital adequacy and banks financial performance in Nigeria, recommended that for banks to earn sustainable interest income streams, appropriate credit risk strategies to be instituted. Banks were also recommended to facilitate the functioning of credit bureaus, this could ensure that financial creditworthiness of lenders are analysed when loan requests are made.

Evelyn, Marcellina and Earsmus (2008) in their study of credit risk management in Tanzania elaborates that banks should have a well-documented credit risk management policy that explains the various credit tools offered and all processes to be implemented to manage the Credit risk. Elaborating further Boffey & Robson (1995) noted that, whether credit risk management system of a bank will fail or succeed in its intended function relies greatly on the development and nurturing of a strong credit culture spread across the entire bank system from the top management down to the loan officer managing a portfolio of loans

Saiful (2017) reports that effective management of credit risk is a pivotal element in the all-encompassing approach to risk management of banks and is crucial to the to the long-term success banks. The results of the study show that credit risk management and enterprise risk management as a whole have a positive influence on bank performance in Indonesia.

With the introduction of stringent capital maintenance requirements by the Basel accords, the focus of credit risk management has been on maintaining an adequate level of capital so as to be able to absorb any losses faced by bank institutions. Study of impact of capital on bank performance conducted by researchers of the likes of Chien-Lee, Shao-Lin and Chi-Chuan (2015) show that capital indeed has a positive impact on bank profitability and risk exposure. These findings were further verified by Trujillo-Ponce (2013) in his study of the determinants of profitability of banks in Spain. However, interestingly the same researcher found that impact of bank capital on profitability depends on whether profitability is viewed from capital or assets perspective (ROA or ROE). When

ROA is considered the effect is positive and significant, but analysis of impact of capital on ROE show that the effect is negative.

In addition, Didar and Andrey (2016) in their analysis of the credit risk management practices in Europe noted the importance of banking regulation. The study considered the effect Basel accord guidelines have on minimizing the non-performing loans in a bank. The results of the study show that European banks that have shown a strong commitment to adopting Basel accords were able to better control credit risk and minimize non-performing loans, compared to those that were slower to adopt the new accords.

Furthermore, Mohammad Bitar, Kuntara and Thomas (2017) argues that while both risk weighted and non-risk weighted capital adequacy ratios work towards improving profitability of banks, however, risk weighted ratios do not show a tendency to assist mitigate bank credit risk. This could have a significant impact for the proposed implementation of the newest Basell capital adequacy requirements

Profitability is an indicator of banks' ability to generate positive cash flows and maintain sustainable earnings. It signifies banks' competitive strength and measures the caliber of stewardship. The determinants of commercial banks' profitability can be identified into two categories, namely, those that are management controllable (internal determinants) and those are beyond the control of management (external determinants) (Nicolae , Bogdan , & Iulian , 2015).

3. RESEACH DESIGN AND METHODS

3.1 Overview

As per the objectives of this research, to elucidate and identify whether a relationship exists along with an understanding of cause and effect of the selected variables, content analysis based quantitative analysis approach was used based on an analysis of secondary data; Annual Reports of the Banks. The cross sectional analysis are based on four variables/indicators; Return on Assets (ROA), Return on Equity (ROE), Non-Performing Loan Ratio (NPLR) and Capital Adequacy Ratio (CAR). ROA and ROE were used as quantitative indicators of profitability of commercial banks, while NPLR and CAR used as credit risk management indicators. This study focus on the relationship between credit risk management and profitability of commercial banks in Sri Lanka from 2014 to 2017.

3.2 Population and Study Sample

The population of the research includes licensed commercial banks in Sri Lanka. As of August 2018, according to the Central Bank of Sri Lanka website, there are 26 licensed commercial banks in operation in Sri Lanka (Annex 1). For this study, researcher will use a mix of convenience and purposive sampling methods to select banks based on: the accessibility of published annual reports, those publishing data related to variables of the research, and representativeness of the sample. Representativeness of the sample will be maintained by selecting a sample which includes both government owned and private commercial banks.

Since the focus of the research is more relevant to Sri Lanka, Foreign banks which are not providing data specifically for Sri Lanka branch/operations or not providing some variables (Amana Bank) will not be included in the sample. The final sample consist 12 commercial banks—including two commercial banks owned by the Government of Sri Lanka—out of 26. Data is obtained for three financial years from 2014 to 2017. Annexure II provides details about the sample—list of banks selected, abbreviation used in the data sample, category of the Bank (based on ownership type):

3.3 Conceptual Framework

As the main objective of this study was to assess the impact of credit risk management on the profitability of commercial banks in Sri Lanka, conceptual framework was developed to test the relationship between identified variables. Based on the objective of the study, conceptual model was developed based on previous literature.

Literature review findings reveal that, bank profitability can be measured by ROE and ROA, and CAR and NPLR will help to assess the level of credit risk management in banks. Hence, the following conceptual framework was developed considering the scope of this study in terms of variables identified:
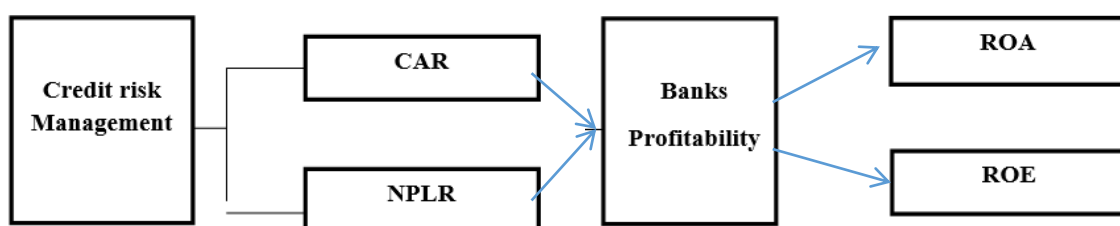

Figure 3.1: Conceptual Framework

3.4 Methods of Measurements

Developing the method of measurement involved standard process; concepts were developed following the literature, and the dimensions were specified after considering variables and most suitable dimensions, indicators were selected as per the objectives of the study.

3.4.2 Operationalization Model

The operational model of the research was developed by assigning variables as per the concepts, covering dimension of each variable, and the relevant indicators—measured using data derived from annual reports.

Following table (Table 3: 2) presents the operationalization model of the study:

Dependent Variable Concept **Profitability of Licensed Commercial Banks**	ROE	Net Income/ Total equity
	ROA	Net income/ Total assets
Independent Variable Concept **Credit Risk Management**	CAR	Total Capital/ Risk Weighted Assets
	NPLR	NPLs/Total loans

The decision to use CAR and NPLR as indicators of credit risk management are based on their intuitive relationship with credit risk exposure of a bank and frequency of occurrences in previous studies, like that of Hakim and Neaime (2005), Mohammad Bitar, Kuntara and Thomas , LI & Zou (2014), and Poudel (2012). CAR is a measure of bank's capital related to the amount of risk weighted credit exposure. It is also regulated in Basel regulations and a key determinant in any credit risk management frameworks. As for NPLR, it is relevant with bank loans. Non-performing loans and advances have a direct impact on banks' credit risk and affect the efficiency of credit risk management.

3.4.3 Hypotheses

The following two null hypotheses will be tested in the research

H0: There is no correlation between credit risk management (as measured by CAR and NPLR) and profitability (as measured by ROE) of commercial banks.

Ha: There is a correlation between credit risk management (as measured by CAR and NPLR) and profitability (as measured by ROE) of commercial banks.

Hθ: There is no correlation between credit risk management (as measured by CAR and NPLR) and profitability (as measured by ROA) of commercial banks.

Hα: There is a correlation between credit risk management (as measured by CAR and NPLR) and profitability (as measured by ROA) of commercial banks.

3.5 Data Analysis Strategies

Data will be presented using tables and charts prepared using Microsoft Word and Excel software, in addition to Statistical Package for Social Science (SPSS) version 21 which will be used to analyse data and to make conclusions. In order to identify the relationship between credit risk management and profitability of commercial banks in Sri Lanka from 2014 to 2017, researcher will test correlation and multiple regressions.

4. FINDINGS AND DISCUSSION

4.1 Data collected from the sample (Annual Reports of the Selected Banks) and analysis

Data for three consecutive financial years from 2014 to 2017 was used in this study. For each selected bank data was extracted for 3 financial years from 2014 to 2017, notwithstanding differences in financial year ends, i.e 31st March year end or 31 December year end.

4.2 Descriptive statistics of the data

As per the conceptual framework and hypothesis, dependent variables (ROE and ROA) were tested with two independent variables (CAR and NPLR). The descriptive statistics table shown below (Table 4.2: Descriptive Statistics of the Sample) presents mean value and standard deviation for 4 variables selected. Data on all variables (ROE, ROA, CAR [Total] and NPLR) of the sample show similar trend. During the period conisidered, banks have maintained an average NPLR of 2.9% against an impressive ROE of 17.2%. ROA is a measely 1.5% due to asset heavy strcuture of the finance industry.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
DV_ROE	36	-5.01	28.47	13.4208	8.68268
DV_ROA	36	-3.13	7.34	1.5604	2.05840
IV_1_CAR	36	11.4	50.81	17.2758	10.17016
IV_2_NPLR	36	0.94	5.27	2.9429	1.17037
Valid N (listwise)	36				

Table 4.1: Descriptive Statistics of the Sample

4.3 Association of relationship between independent and dependent variables

The correlation between credit risk management and profitability of commercial banks in Sri Lanka were tested using correlation analysis. Before performing the correlation test, scatter plot diagrams were generated to check whether there is a linear relationship between two variables (IV and DV). Researcher first created the scatterplot for CAR (IV) and ROE (DV).

Though the strength of the relationship between two variables provides crucial information, interpretation of a scatterplot is too subjective. Hence, more precise evidence was obtained by computing a coefficient. A scatterplot displays the strength, direction, and form of the relationship between two quantitative variables, and the strength of that relationship should be measured using correlation coefficient measures.

Pearson correlation analysis

Before regression analysis, researcher performed Pearson correlation analysis. The Statistical Significance was measured through Correlation Coefficients. The Correlation coefficients have a probability (p-value). It shows the probability that the relationship between the two variables is equal to zero (null hypotheses; no relationship). Strong correlations have low p-values because the probability that they have no relationship is very low. Correlations are typically considered statistically significant if the p-value is lower than 0.05 in the social sciences. In this research also, researcher set p-value as 0.05.

Correlations

		IV_1_CAR	IV_2_NPLR	DV_ROA	DV_ROE
IV_1_CAR	Pearson Correlation	1	-.478	-.568	-.689[*]
	Sig. (2-tailed)		.116	.054	.013
	N	36	36	36	36
IV_2_NPLR	Pearson Correlation	-.478	1	-.073	.438
	Sig. (2-tailed)	.116		.822	.155
	N	36	36	36	36
DV_ROA	Pearson Correlation	-.568	-.073	1	.022
	Sig. (2-tailed)	.054	.822		.947
	N	36	36	36	36

		-.689*	.438	.022	1
DV_ROE	Pearson Correlation				
	Sig. (2-tailed)	.013	.155	.947	
	N	36	36	36	36

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

Table 4.2: Correlation Matrix

Based on the results, researcher noted that profitability of Licensed Commercial Banks in Sri Lanka (ROE) and CAR has a statistically significant linear relationship. The value of p is 0. 013 (p < .005) and Pearson Correlation is - 0.689 (r= - 0.689). The r value falls under the High negative correlation. Based on the results, researcher also noted other variables are not statistically significant. For example, relationship between ROE and NPLR is not significant as the p is 0.155 (p >.005) for ROE and NPLR, and Pearson Correlation is 0.438. The r value falls under the weak or not positive correlation.

4.4 Regression Analysis

In order to answer research question, researcher conducted two regression analyses for hypothesis testing. Results are summarised under two regressions. However, prior to any statistical testing, an assessment of normality of data was performed; both numerical and graphical methods were employed.

As the sample size is less than 50, Shapiro –Wilk Test was more appropriate and was performed for all variables. In Shapiro –Wilk Test, significance levels of all variables were above 0.05 per cent, thus failing to reject the null hypothesis of Shapiro –Wilk Test that underlying data is normally distributed. To further validate the data, the normality was assessed by reference to Normal Q-Q plots. Based on results obtained, it was concluded that variables are normally distributed, therefore parametric testing is valid.

The correlation matrix presented above also indicate the absence of multicollineaity among the explanatory variables as the highest correlation coefficient seen is -0.689, which is considered too low to imply a linear relationship between variables (a threshold of 0.8 was considered). To further strengthen the conclusion, multicollineaity diagnostic tests were performed. Variance inflation factor (VIF) for each explanatory variable is below 1.3, well below the threshold of 2.5 normally required to indicate a linear relationship. To ensure homoscedasticity of data, Glejser test was

performed. Significance of each variable was above 0.05 level of significance, indicating absence of heteroskedastcity, thus ensuring homoscedasticity.

4.4.1. Regression 1 – Hypothesis I

$$ROE_t = \beta_1 + \beta_2 \times CAR_t + \beta_3 \times NPLR_t$$

The first regression analysis was done using ROE as the dependent variable.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.700a	.490	.377	6.85323	.048

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	19.530	8.799		2.220	.054
	IV_1_CAR	-.531	.231	-.622	-2.297	.047
	IV_2_NPLR	1.042	2.010	.140	.519	.617

Hypothesis I
H0: There is no correlation between credit risk management (as measured by CAR and NPLR) and profitability (as measured by ROE) of commercial banks.

Hα: There is a correlation between credit risk management (as measured by CAR and NPLR) and profitability (as measured by ROE) of commercial banks.

First regression analysis (DV=ROE) indicated correlation coefficient (R value) as 0.700. This means that there is a high positive correlation between dependent variable and independent variables because R value is positive and 0.700 falls under coefficient range corresponding to high positive correlation. The R square indicates the extent or percentage the independent variable can explain the variations in the dependent variable. According to the first regression, independent variables can explain 49 % (0.490) of variations in dependent variable. However, it still leaves 51 % unexplained in this study. The overall significance of the regression as measured by the F

statistic indicates that dependent variables (credit risk management) do explain variation of the profitability of banks and rejects the null hypothesis that all slope coefficients are zero.

Insignificant results

The regression analysis indicates that p-value for NPLR is 0.617. Under the condition that the level of significance is 5 percent, a p-value less than the 5 percent should be required to reject hull hypothesis. As a result, the first part of null hypothesis 1 that "there is no correlation between NPLR and ROE" should not be rejected. Therefore the results for regression analysis 1 demonstrate that the relationship between NPLR and ROE is insignificant. It is not similar to the findings of Ndoka & Islami (2016) as they found that high NPL affects the bank profitability. Sandra and Marija (2017) also concluded banks having significant loan loss provisions in comparison to total assets experience lower profits.

Significant results

The regression analysis indicates that p-value for CAR 0.047. As a result, the second part of null hypothesis 1 that "there is no correlation between CAR and ROE" should be rejected. Therefore the results for regression analysis 1 demonstrate that the relationship between CAR and ROE is significant. As this is a negative value, it is further concluded that increase of Capital Adequacy Ratio (CAR) reduces the profitability of commercial banks in Sri Lanka. It is similar to Li & Zou (2014) findings; negative relationship between CAR and ROE and between CAR and ROA. However, this finding contradicts with Mohammad Bitar, Kuntara and Thomas (2017)'s conclusion that CAR work towards improving profitability of banks.

4.4.2. Regression 2 – Hypothesis II

$$ROA_t = \beta_1 + \beta_2 \times CAR_t + \beta_3 \times NPLR_t$$

The second regression analysis was done using ROA as the dependent variable.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
1	.690a	.477	.360	1.64619	.044

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.602	2.114		3.124	.012
	IV_1_CAR	-.158	.056	-.781	-2.847	.019
	IV_2_NPLR	-.785	.483	-.446	-1.625	.139

a. Dependent Variable: DV_ROA

Hypothesis II

Hθ: There is no correlation between credit risk management (as measured by CAR and NPLR) and profitability (as measured by ROA) of commercial banks.

Hα: There is a correlation between credit risk management (as measured by CAR and NPLR) and profitability (as measured by ROA) of commercial banks.

Second regression analysis (DV=ROA) indicated correlation coefficient (R value) as 0.690. This means that there is a high positive correlation between dependent variable and independent variables because R value is positive value and 0.690 falls under coefficient range corresponding to high positive correlation. According to the first regression, independent variables can explain 47% (0.477) of variations in dependent variable. However, it still leaves 53% unexplained in this study. The overall significance of the regression as measured by the F statistic indicates that dependent variables (credit risk management) do explain variation of the profitability of banks and rejects the null hypothesis that all slope coefficients are zero.

Insignificant results

The regression analysis indicates that p-value for NPLR is 0.139. Under the condition that the level of significance is 5 percent, a p-value less than the 5 percent should be required to reject hull hypothesis. As a result, the first part of null hypothesis 1 that "there is no correlation between

NPLR and ROE" should not be rejected. Therefore the results for regression analysis 1 demonstrate that the relationship between NPLR and ROA is insignificant.

Significant results

The regression analysis indicates that p-value for CAR 0.019. As a result, the second part of null hypothesis 1 that "there is no correlation between CAR and ROE" should be rejected. Therefore the results for regression analysis 1 demonstrate that the relationship between CAR and ROA is significant. This is in contrast to findings of researchers like Kithinji (2010), who found no relationship between CAR and ROA based analysis of 43 commercial banks in Kenya.

5. CONCLUSION, LIMITATIONS AND FUTURE DIRECTIONS

The study attempted to analyse how credit risk management impacts commercial banks' profitability using quantitative secondary data available in annual reports of commercial banks in Sri Lanka. This study aimed to fill the gap in literature and provide empirical evidence about the impact of credit risk management on bank profitability. As the research is based more on quantitative methodologies, it is being focused on testing a theory rather than generate a theory, which is the deductive approach. The relationship of the dependent (profitability) and independent (credit risk management) variables were assessed for statistical significance, using ROE and ROA as proxies for the dependent variable and CAR and NPLR for the independent variable. Upon data collection

The problem statement "*What is the relationship between credit risk management and profitability of commercial banks in Sri Lanka from 2014 to 2017?*" were answered by analysing multiple regressions. Based on the results of parametric testing it can be concluded that there exists a relationship between credit risk management and profitability. Firstly, our empirical findings show that the relationship between NPLR and ROE and NPLR and ROA are not significant. Secondly, we found that there is a significant negative relationship between CAR and ROE and between CAR and ROA. It is similar to Li & Zou (2014) findings. However, this finding contradicts with Mohammad Bitar, Kuntara and Thomas (2017)'s conclusion that CAR work towards improving profitability of banks. This could be due to the tight monetary policy in place in Sri Lanka.

Finally, based on the results, we would like to offer several recommendations. As a negative relationship was identified between CAR and profitability, banks should pay close attention to how

Basel III requirements are met. However, observed negative relationship could be due to heavy reliance on subordinated debenture issues by banks in a tight monetary policy environment to meet Basel requirement deadlines. It is also recommended that new research should be conducted analysing data series for past few years. Due to various practical limitations and the coverage of data and the influence of other variables should be considered in future research. As some findings contradict with prior empirical research, impact of various government policies and other variables should take in to consider when planning future studies.

REFERENCES

Abdu, C., Ul Hassana, H. & Ilyasb, M. I., 2014. Quantitative Study of Bank-Specific and Social factors of Non-Performing Loans of Pakistani Banking Sector. *International Letters of Social and Humanistic Sciences,* Volume 43, pp. 192-213.

Ameni , G., Hasna , C., & Mohamed, A. (2017). The effects of liquidity risk and credit risk on bank stability: Evidence from. *Journal of Accounting and Economics*, 1-11.
Bernanke, B. (1993). Credit in the Macroeconomy. *Federal Reserve Bank of New York*, pp. 50-50.

Bryman, A., & Bell, E. (2008). *Business Research Methods* (2nd Edition ed.). Oxford: Oxford University Press.

Boffey , R., & Robson, G. (1995). Bank Credit Risk Management. *Advances in Management Accounting*, 66-78.

Behest, J., Chen, J., Huang, Y. & Cohen, I., 2009. *Pearson correlation coefficient. In Noise reduction in speech processing.* Berlin, Heidelberg: Springer.
Bland, J. & Altman, D., 1996. *Statistics notes: measurement error. Bmj, 313(7059), p.744).,* s.l.: s.n.

BrckaLorenz, A., Chiang, Y. & Nelson Laird, T., 2013. *Internal consistency. FSSE Psychometric Portfolio. Retrieved from fsse.indiana.edu,* s.l.: s.n.

Central Bank of Sri Lanka , 2018. *Annual Report 2017.* Colombo : Central Bank of Sri Lanka .

Central Bank of Sri Lanka , 2018. *Cbsl.gov.lk.* [Online]
Available at: https://www.cbsl.gov.lk/en/authorized-financial-institutions/licensed-commercial-bank[Accessed 16 October 2018].

Central Bank of Sri Lanka, 2016. *Annual Report 2015,* Colombo: Central Bank of Sri Lanka.

Central Bank of Sri Lanka, 2018. *Annual Report 2017 ,* Colombo: Central Bank of Sri Lanka.

Campbell, A. (2007). Bank insolvency and the problem of nonperforming loans. *Journal of Banking Regulation, 9*(1), 25-45.

CBSL. (n.d.). Retrieved February 12, 2018, from Central Bank of Sri Lanka: https://www.cbsl.lk

Charles, O., & Kenneth, U. O. (2013). Impact of Credit Risk Management and Capital Adequacy on the Financial Performance of Commercial Banks in Nigeria. *Journal of Emerging Issues in Economics, Finance and Banking*.

Central Bank of Sri Lanka, 2018. *www.cbsl.gov.lk.* [Online]
Available at: https://www.cbsl.gov.lk/en/financial-system/financial-system-stability/banking-sector
[Accessed 16 October 2018].

Central Bank of Sri Lanka, April 2018. *Guidelines on opening of New Banks in Sri Lanka,* Colombo: Central Bank of Sri Lanka.

Chien-Chiang Lee, L., Shao-Lin , N., & Chi-Chuan , L. (2015). How does Bank Capital Affect Bank Profitability and. *Contemporary Accounting Research*, 19-39.

Diana, . M. & Balentyne, P., n.d. Scatterplots and Correlation. In: *The Basic Practice of Statistics.* 6 ed. s.l.:s.n.

Didar , E., & Andrey , G. (2016). The Effect of Regulatory and Risk Management Advancement on Non-Performing Loans in European Banking, 2000–2011. *Review of Accounting Studies*, 249-262.

Djalilov, K., & Piesseb, J. (2016). Determinants of bank profitability in transition countries:. *Journal of Accounting and Economics*, 69-82.

Evelyn , R., Marcellina , C., & Erasmus , L. (2008). Credit risk. *Advances in Management Accounting*, 323-332.

GTZ ProMiS in collaboration with The Banking with the Poor Network, 2010. *Microfinance Industry Report 2010 -Sri Lanka Updated Edition,* s.l.: GTZ ProMiS in collaboration with The Banking with the Poor Network.

GTZ ProMiS in collaboration with The Banking with the Poor Network, 2009. *Microfinance Industry Report -Sri Lanka,* s.l.: GTZ ProMiS in collaboration with The Banking with the Poor Network.

Hakim, S., & Neaime, S. (2005). Profitability and Risk Management in Banking: A Comparative Analysis of Egypt and. *Advances in Management Accounting*, 117-131.

Kithinji, A.M. (2010). Credit Risk Management and Profitability of Commercial Banks in Kenya, School of Business, University of Nairobi, Nairobi.

Li, F. & Yijun Zou, 2014. *The Impact of Credit Risk Management on Profitability of Commercial Banks: A Study of Europe,* Umea : Umea School of Business and Economics.
Merchant Bank of Sri Lanka & Finance PLC, 2018. *Merchant Bank of Sri Lanka & Finance PLC.* [Online]
Available at: www.mbslbank.com
[Accessed 8 July 2018].

LI, F., & Zou, Y. (2014). *The Impact of Credit Risk Management on Profitability of Commercial Banks : a study in Europe.* New Hampshire: Umea School of Business and Economics.

Million, G., Matwos, & Sujata, S. (2015). The impact of credit risk on profitability performance of commercial banks in Ethiopia. *African Journal of Business Management*, 59-66.

Mohammad Bitar, Kuntara , P., & Thomas, W. (2017). The effect of capital ratios on the risk, efficiency and profitability of banks: Evidence from OECD countries. *Journal of Accounting and Economics*.

Ministry of Finance - The Treasury of Sri Lanka, 2017. *Treasury.gov.l.* [Online]
Available at: http://www.treasury.gov.lk/web/guest/sri-lanka-at-a-glance
[Accessed 16 October 2018].

Moore, . D. S., Notz, W. I. & Flinger, M. A., 2013. The basic practice of statistics. In: New York, NY: W. H. Freeman and Company

Nicolae , P., Bogdan , C., & Iulian , I. (2015). Determinants of banks' profitability: evidence from EU 27 banking. *Journal of Accounting and Economics*, 518-524.

Noor , U., Smita, K., & Singh, S. (2018). Basel I to Basel III: Impact of Credit Risk and Interest Rate Risk of Banks in India. *Journal of Accounting Auditing and Finance*, 84-111.

Ndoka, S., & Islami, M. (2016). The Impact of Credit Risk Management in the Profitability of Albanian Commercial Banks During the Period 2005-2015. *European Journal of Sustainable Development*, 445-452.

.Norhaziah Nawai & Mohd Noor Mohd Shariff, 2012. Factors affecting repayment performance in microfinance programs. *Procedia - Social and Behavioral Sciences,* Volume 62, p. 806 – 811.

Poudel, R. P. (2012). The impact of credit risk management on the financial performance of commercial banks in Nepal. *International Journal of Arts and Commerce (April, 1*(5).

Saiful , S. (2017). Contingency Factors, Risk Management, and. *Asian Journal of Accounting and Governance, 9*(1), 35-53.

Sandra, P., & Marija, T. (2017). Credit Risk and Bank Profitability: Case. In *Finance in Central and Southeastern Europe* (pp. 135-144).

Sufian , F., & Akbar , N. (2012). Determinants of Bank Performance in a Developing Economy : Does Bank Origins Matters? *Journal of Accounting Auditing and Finance*, 1 to 23.

Semere, S. E., & Abderman, F. Z. (2017). The Impact of Credit Risk Management on Financial Performance of Commercial Banks –Evidence from Eritrea. *Research Journal of Finance and Accounting, 8*(19).

Trujillo-Ponce, A. (2013). What determines the profitability of banks? Evidence. *Contemporary Accounting Research*, 561-586.

Ucheaga, E., Achugamonu, B., Adetiloye, K., & Taiwo, J. N. (2017). Credit Risk Management: Implications on Bank Performance and Lending Growth. *Saudi Journal of Business and Management Studies, 2*(5B).

OECD, 3-5 June 2004. *Promoting SMEs for Development: , 2nd OECD conference of ministers responsible for small and medium-sized enterprises (SMEs) Promoting Entrepreneurship and Innovative SMEs in a Global Economy: Towards a more responsible and inclusive globalisation.* Istanbul, turkey, Organisation for Economic Co-operation and Development (.

Sajitha Thilanka , R., 2011. *Factors affecting on Microfinance Loan Repayment with Reference to SEEDS Institute..* s.l.:University of Sri Jayewardenepura, Master of Business Administration, Dissertation.

Shu-Teng, M. A. Zariyawati, M. Suraya-Hanim & M.N. Anuar, 2015. Determinants of Microfinance Repayment Performance: Evidence from Small Medium Enterprises in Malaysia. *International Journal of Economics and Finance,* 1(11).

The International Trade Administration (ITA), U.S. Department of Commerce , 2018. *Export.gov.* [Online]
Available at: https://www.export.gov/article?id=Sri-Lanka-Banking-Systems
[Accessed 16 October 2018].

Trujillo-Ponce, A. (2013). What determines the profitability of banks? Evidence. *Contemporary Accounting Research*, 561-586.

Ucheaga, E., Achugamonu, B., Adetiloye, K., & Taiwo, J. N. (2017). Credit Risk Management: Implications on Bank Performance and Lending Growth. *Saudi Journal of Business and Management Studies, 2*(5B).

APPENDICES

Annexure 1: List of Commercial Banks in Sri Lanka

1. Amana Bank PLC
2. Axis Bank Ltd
3. Bank of Ceylon
4. Bank of China Ltd
5. Cargills Bank Ltd
6. Citibank, N.A.
7. Commercial Bank of Ceylon PLC
8. Deutsche Bank AG
9. DFCC Bank PLC
10. Habib Bank Ltd
11. Hatton National Bank PLC
12. ICICI Bank Ltd
13. Indian Bank
14. Indian Overseas Bank
15. MCB Bank Ltd
16. National Development Bank PLC
17. Nations Trust Bank PLC
18. Pan Asia Banking Corporation PLC
19. People's Bank
20. Public Bank Berhad
21. Sampath Bank PLC
22. Seylan Bank PLC.
23. Standard Chartered Bank
24. State Bank of India
25. The Hongkong and Shanghai Banking Corporation Ltd (HSBC)
26. Union Bank of Colombo PLC

Annexure II: List of commercial banks selected for the study sample

No	Name of the Bank	Abbreviation	Category
1	People's Bank	Peoples	Government Commercial Banks (GCB)
2	Bank of Ceylon	BOC	
3	Seylan Bank PLC.	Seylan	Private Commercial Banks (PCB)
4	Sampath Bank PLC	Sampath	
5	Commercial Bank of Ceylon PLC	Commercial	
6	National Development Bank PLC	NDB	
7	Hatton National Bank PLC	HNB	
8	Nations Trust Bank PLC	NTB	
9	Union Bank of Colombo PLC	Union	
10	DFCC Bank PLC	DFCC	
11	Cargills Bank PLC	Cargills	
12	Pan Asia Banking Corporation PLC	Pan-Asia	