Impact of Credit Risks on Profitability of the Systematically Important Licensed Commercial Banks in Sri Lanka

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ABSTRACT

Purpose: This paper focuses on analyzing the impact of credit risks on the profitability of six major licensed commercial banks in Sri Lanka which account for around 53% of the market share from 2017 to 2021.

Design/Methodology/Approach: Return on Equity (ROE) was considered to measure the profitability while measuring the credit risks and it was carried out through Non-Performing Loan ratio (NPL), Capital Adequacy Ratio (CAL), Total Loan to Assets ratio (LTA), and Total Loan to Deposit ratio (LTD). STATA is used to analyze the data. To test the hypothesis, Pooled OLS, random, and fixed effect models are employed, and the most suitable model is picked through the Breusch and Pagan LM test and Hausman tests. Based on the results pooled OLS is selected for the interpretation with an Adjusted R^2 of 74%.

Findings: The study reveals a significant negative impact of NPL on profitability, suggesting that increased NPL proportions heighten credit risk, potentially leading to losses and reduced profitability. Conversely, the LTD shows a negative relationship, potentially exposing banks to higher default risks despite boosting interest income. However, LTA demonstrates a positive relationship with ROE within a certain limit, suggesting enhanced interest income without significant default risk escalation. CAR, however, does not directly impact profitability, emphasizing its role in ensuring capital adequacy and regulatory compliance.

Originality: This study only focuses on the systematically important licensed commercial banks as they represent more than 50% of the market share and have a significant influence on the Sri Lankan economy. Hence, managing their credit risk exposures is significantly important for the country.

I. Introduction

Contemporary banking systems expose to various risks including credit risks, liquidity risks, operational risks, foreign currency risks, and technology risks in which significant levels of risk arise from credit risk (Prasad, 2020; Boahene et al., 2012). Licensed commercial Banks (LCBs) generate revenue, mainly by providing credit/loans to customers. However, banks are exposed to a high level of credit risk when possible defaults increase which may severely affect banks' performances (Li & Zou, 2014). Since banks are the core of any country's financial system, this may collapse the whole economy through the contagion effect. Therefore, it is essential to manage the credit risk of the banks in the country (Sharma et al., 2024; Naili & Lahrichi, 2022).

Risk management is the process of analyzing and estimating the risk levels to determine the risk mitigating strategies (Akinbo & Elizabeth, 2022). Efficient credit management often assists the banks in having profitability and viability business and allows the economy to have stability and

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efficient allocation of capital resources (Psillaki et al., 2010).

By disbursing loans to customers, banks earn interest income and receive capital through instalments which is stated on the loan agreement between the bank and customer. When a customer fails to repay the installments for more than ninety days, Non-Performing Loans (NPL) will appear. The main contributors to these defaults are the customer who faces financial stress and the credit quality of the borrower deteriorates (Li & Zou, 2014). Hence, measuring the financial soundness of the customers is vital to have a lower level of NPL (Prasad, 2020). Further, modern banks are significantly exposed to derivative markets which raise the credit risks of the banks.

LCBs have efficient credit risk management to maximize the performance of banks while maintaining the credit risk exposure within the acceptable level (Akinbo & Elizabeth, 2022). To monitor credit risk levels, banks carry out rigorous credit analysis for loan products and customer segments. Banks estimate the credit risk level in different scenarios to prepare themselves to face any adverse conditions. Further, currently, banks are required to produce risk information reports and risk scoring to control the credit risk level. Having robust credit risk management is prioritized not only by the banks and financial institutions, but also by banking regulators to alleviate the risk level by promoting sound credit risk management (Butola et al., 2022). In Sri Lanka, the Central bank and Banking act impose various measures to ensure that the credit exposure of banks is within the limit.

Therefore, any bank needs to have a sound credit management system.

Several theoretical backgrounds and empirical pieces of evidence highlight the impact of robust credit management on the banks' performances. (Li & Zou, 2014; Gadzo et al., 2019; Prasad, 2020; Basel Committee on Banking Supervision, 1999; Ogboi & Unuafe, 2013). However, outputs revealed contradicting results. Considering the importance given by the Central Bank of Sri Lanka (CBSL), Basel committee, policy makers and practitioners, it is critical to analyze the impact of credit risk management on the performance of LCBs in Sri Lanka. For analytical purposes, this paper considers six systematically important commercial banks (Madhuwanthi & Morawakage, 2019) and covers five-year period from 2017 to 2021. According to the literature review, no research exclusively used only systematically important banks to investigate the relationship between credit risks and company profitability.

Further, in recent times, the non-performing loans in Sri Lanka have been on the rise as shown in the figure 01 below, primarily attributed to significant economic instability over the past five years. This period was marked by a series of unfortunate events, starting with the repercussions of the Easter attacks in 2019, followed by the impact of COVID-19 pandemic, and further compounded by the financial crisis in Sri Lanka from 2022 to 2023 (Economynext, 2023). Hence, there is a pressing need for banks to implement robust mechanisms to mitigate credit risks effectively.

PEAKING?
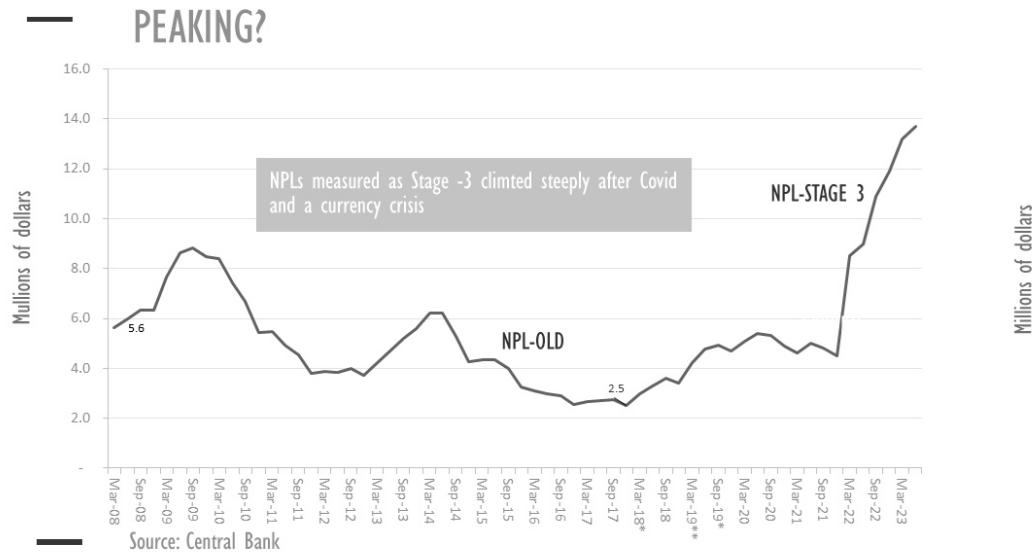
Figure 1. Non-performing loans in Sri Lanka

Thus, this research paper aims to investigate the impact of credit risk on the profitability of systematically important commercial banks in Sri Lanka. The credit risks of these banks are measured using Non-Performing Loan ratio (NPL), Capital Adequacy Ratio (CAR), Total Loan to Assets Ratio (LTA) and Total Loan to Deposit Ratio (LTD) and the results will assist banks, borrowers, central bank, government and investors to take effective decisions on loan portfolios.

II. Literature Review

The historical evolution of credit risk management in banking provides a detailed overview of how financial institutions have adapted their strategies and methodologies to address the risks associated with lending. Over time, significant milestones reflect the banking sector's responses to changing environmental landscapes, regulatory environments, and technological advancements. Credit risk management has been always central part to banking operations, playing a vital role in maintaining financial stability and profitability (Wilhelmina et al., 2024).

Initially, credit risk management relied heavily on manual processes and the subjective judgment and experience of bankers. Personal knowledge of borrowers and the use of collateral served as the primary means of mitigating risk. However, as the banking industry expanded and transaction volumes grew these traditional methods became insufficient, urging the need for more sophisticated and systematic approaches (Dalessandro, 2012; Wilhelmina et al., 2024).

The introduction of credit scoring in the mid-20th century marked an important advancement in credit risk management. This approach offered a more sophisticated way of assessing the borrower's risk. However, these models have limitations, particularly in adapting to rapidly changing market conditions and in accounting for various risk factors (Sarıhan & Başarır, 2017; Wilhelmina et al., 2024).

The financial crisis of the late 20th and 21st centuries highlighted the importance of more sophisticated credit risk management frameworks. In response, regulatory bodies worldwide implemented stricter regulations and capital requirements such as the Basel framework, to improve the resilience of the banking sector (Pham & Daly, 2020).

Theoretically, loan pricing theory (Naili & Lahrichi, 2022), agency theory (Naili & Lahrichi, 2022), information asymmetry theory (Igawa & Kanatas, 1990), moral hazard (Edelberg, 2004), and adverse selection theory (Edelberg, 2004) are studied to support this study. Loan pricing theory focuses on how banks determine the interest rates they charge on the loans they provide to customers. Banks normally adjust their interest rates based on the perceived risk of default by the borrower. Higher-risk loan portfolios should carry higher interest rates to compensate for the increased likelihood of default. Further, agency theory highlights the potential conflicts may arise between bank management, who may pursue riskier lending practices to maximize short-term profits, and shareholders, who are concerned with the long-term stability and profitability of the banks. Therefore, when giving loans to different customers, banks should strike a balance between short-term and long-term profitability.

Information asymmetry theory suggests that in the transactions one party may have more or better information than the other, leading to inefficiencies in the banking sector. In this context, borrowers may have more information than lenders about their financial performance. Commercial banks must assess and manage this information asymmetry to accurately price loan interests and mitigate the default risks. Moreover, moral hazard arises when borrowers may engage in riskier behavior because they know they are protected by insurance or they believe that the bank will be bailed out in the case of financial distress. Commercial banks must monitor and mitigate moral hazard to prevent excessive risks-taking by borrowers.

In the context of credit risk, adverse selection refers to the situation where borrowers who are more likely to default are more eager to take out loans, leading to a higher proportion of risky borrowers in the bank's loan portfolio. Commercial banks must implement screening and monitoring mechanisms to mitigate adverse selection and reduce the incidence of default.

Furthermore, empirical studies by scholars produced inconsistent results regarding the relationship between credit risk and profitability globally, as shown below.

According to Saghir and Tabassam (2020), credit risk has a significant negative impact on the financial performance of the banks in Pakistan. In their study, the period from 2008 to 2018 was examined by analyzing both short-term and long-term effects through panel data. This study is similar to another carried out in Nigeria which, tested the impact of credit risks on the financial performance of commercial banks for the period from 2008 to 2012. The study revealed a significant negative relationship between NPL to loan and profitability of the banks (Olawale, 2014). Further, Kodithuwakku (2015) conducted a research to examine the relationship between credit risk and performance in Sri Lanka, covering the period from 2009 to 2013 for eight banks. The conclusion indicated that there was a negative relationship between both factors.

Another study was conducted in Nigeria for the period from 2011 to 2022 evaluated the impact credit risk management on the financial performance of banks, and the results revealed a significant relationship between them. Additionally, Darmoe (2020) reported that the financial performance of Pakistani commercial banks is negatively affected by credit risk. To measure the credit risk level of the commercial banks, non-performing loans were analyzed in this study, which covered a 10-year period until 2018.

A study in Bangladesh, covering the period from 2010 to 2019, showed a negative relationship between certain financial metrics and bank performance. To measure the performance of the banks ROA was used, while credit risk was assessed using Non-performing Loans, Capital Adequacy Ratio, and Loan to Deposit Ratio. The

Former two variables had a negative relationship with bank performance, whereas the latter had a positive impact. (Darmoe, 2020). In Nepal, Prasad (2020) conducted a study over a five-year period from 2014 to 2020. For the analysis, Pooled OLS, Random and Fixed models were employed, and the conclusion indicated that there is a significant negative impact from Non-performing loans, Capital Adequacy Ratio, and liquidity on the ROE of the banks, while size had a positive impact. Inflation did not have any significant impact on ROE.

Kwashie et al. (2022) investigated commercial banks in Ghana, analyzing data from the period 2013 to 2018. To estimate the performance of the banks, both ROE and Economic Value Added were used, while Non-performing Loans were considered as dependent variable of the study. Other factors namely age, size of the banks, GDP, inflation and monetary policy rates were also considered for the study. This study concluded that there is a negative significant relationship between credit risk and the performance of the banks.

According to Afriyie (2013), there is a significant positive relationship between NPLs and the performance of Ghana's rural and community banks; the study concluded that, even though there were higher loan losses, the banks were still earning profits. Another study in Ghana was also revealed a positive impact between credit risk and the performance of the banks. To measure the credit risks, net charge-off rates, NPLs rates, and pre provision profit as a percentage of overall new loans and advances were utilized (Boahene et al., 2012). Furthermore, Marshal and Onyekachi (2022) examined the performances of deposit money banks in Nigeria and their credit risks, concluding that there is a positive relationship between

the ratios of NPLs to loans and advances and ROA.

Adeusi et al. (2014) investigated the link between risk management strategies and bank performance in Nigeria and found that as NPL increase, there is a corresponding decrease in financial performance, thus highlighting the importance of minimizing such loans. Additionally, the study identified that there was a positive relationship between the CAR and financial performance, emphasizing the significance of maintaining sufficient capital levels. This underscores the association between bank performance and the effectiveness of credit risk management.

However, another study which revealed no relationship between the credit risks of commercial and investment banks in Palestine. According to Bayyoud and Sayyad (2015), NPL did not have any significant impact on ROE.

A mixed result was produced by Bandara et al. (2021), who investigated thirteen banks in Sri Lanka over the period from 2010 to 2017. Findings of the study was, non-performing loans had a significant negative impact on ROA while capital adequacy ratio had impacted positively. Furthermore, the net charge-off ratio and loan-to-deposit ratios were not significantly linked to the performance of the banks. This is further supported by Wijesinghe and Gunathilaka (2021) whose study revealed a significant negative impact between non-performing loans and ROA, while a positive emerged from loan losses, total loans to total assets, and total loans to total deposits.

Conceptualization

The following chart illustrates the conceptual framework of the study after studying the literature review.
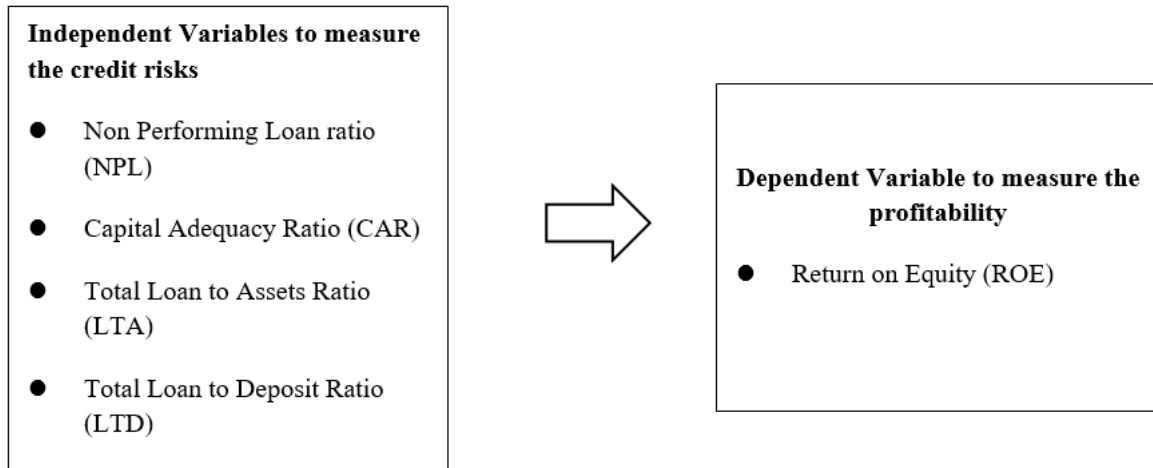
Figure 2. Conceptual Framework

Operationalization

Table 1. Summary Statistics of the variables

Variables	Acronyms	Measurement	Reference
Non-Performing Loan ratio	NPL	$\dfrac{\text{Non-Performing Loan}}{\text{Total Loan}}$	(Munangi & Sibindi, 2020) Bandara et al. (2021) (Mohamed et al., 2024)
Capital Adequacy Ratio	CAR	$\dfrac{\text{Total Capital}}{\text{Total Risk weight Assets}}$	(Munangi & Sibindi, 2020) Bandara et al. (2021) (Mohamed et al., 2024)
Total loan to assets ratio	LTA	$\dfrac{\text{Total Loan}}{\text{Total Assets}}$	Kodithuwakku (2015)
Total loan to deposits ratio	LTD	$\dfrac{\text{Total Loan}}{\text{Total Deposits}}$	Darmoe (2020); Bandara et al.(2021)
Return On Equity	ROE	$\dfrac{\text{Profit After Tax}}{\text{Total Equity}}$	Prasad (2020) (Munangi & Sibindi, 2020) (Mohamed et al., 2024)

Source: Survey data

Research Hypotheses

The following hypotheses are formulated by the researcher to test the objective of the research.

H_1: *Non-Performing Loan has a significant impact on Return on Equity.*

H_2: *Capital Adequacy Ratio has a significant impact on Return on Equity.*

H_3: *Loan to Asset ratio has a significant impact on Return on Equity.*

H_4: *Loan to Deposit ratio has a significant impact on Return on Equity.*

III.   Methodology

This research is grounded in philosophical principles, which can be analyzed through ontological, epistemological, and axiological lenses. This adopts an objectivist view, suggesting that a universal truth exists regarding the impact of credit risks on the profitability of key commercial banks in Sri Lanka. This understanding is derived through panel regression analysis using Stata software. Additionally, the research maintains a detached stance, where researchers remain separate from the study process. This adheres to value-free axiological assumptions emphasizing

neutrality and objectivity. Overall, the research aligns with the positivist paradigm employs a deductive approach, and examines the impact of credit risks on the profitability of the LCBs in Sri Lanka.

CBSL disclosed that there are 30 banks in Sri Lanka, of which 24 banks are LCBs. For the purpose of purposes, only the systematically important six banks namely Bank of Ceylon, Peoples' bank, Commercial Bank, HNB, Sampath bank and National Development Bank which hold majority of market share (approximately 53.2%) are considered based on the purposive sampling technique (KPMG Sri Lanka, 2021). Five years' time periods are taken from 2017 to 2021 for this study. Since this study is a quantitative method, relevant data is collected from secondary sources namely the financial statements of the company, central bank reports and Colombo Stock Exchange.

This study takes ROE as dependent variable to measure the profitability of LCBs. To measure the credit risks of these specific banks, NPL, CAR LTD and LTA are utilized which are the independent variables of the study.

As the first step, several tests are conducted to ensure the data from the selected banks are normally distributed, and to check for multicollinearity in explanatory variables and heteroscedasticity in the variables. Specifically, the Jarque Bera test, Variance Inflation Factor (VIF) test and White test are performed respectively. Furthermore, to test the hypotheses, Pooled OLS, Fixed Effect, and Random Effect models are employed. Them most suitable model for this analysis is determined by using Breusch and Pagan LM test, Hausman test (Munangi & Sibindi, 2020).

Model Specifications

This study focuses on analysing the six systematically important Licensed commercial Banks from 2017-2021 and considers panel data to examine the impact of credit risks on the profitability of the Licensed Commercial Banks.

The following panel data regression model is specified for this paper.

$$ROE = \beta_0 + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3\ LTA_{it} + \beta_4\ LTD_{it} + u_{it} + e_{it}$$

Where,

$B_0, \beta_1, \beta_2, \beta_3, \beta_4$ - Regression co-efficient

ROE - Return on Equity

NPL - Non-Performing Loans ratio

CAR - Capital Adequacy Ratio

LTA - Loan to Assets Ratio

LTD - Loan to Deposit Ratio

e - Error term

u - errors within entities

IV.   Findings and Discussion

Descriptive statistics

Following table 2 displays the summary of collected data.

Table 2. Summary Statistics of the variables

Variable	Obs	Mean	Std. Dev.	Min	Max
ROE	30	.1456	.04927	.0643	.2660
NPL	30	.0416	.01488	.0164	.0643
LTA	30	.6680	.06246	.5162	.7662
LTD	30	.8704	.07920	.69914	.9732
CAR	30	.1571	.01508	.1325	.1828

Source: Survey data

The mean value of the ROE is 14.56% which ranges from 6.43% to 26.60%.

Furthermore, average of NPL is 4.16% which falls in between 1.64% to 6.43%.

Another independent variable, LTA registered an average value of 66.80% with the minimum of 51.62% and 76.62% while LTD has an average value of 87.04%. CAR has a mean value of 15.71% which ranges in between 13.25% and 18.28%.

Normality Test

The following table 3 revealed the results of normality test of residuals

Table 3. Summary Statistics of Jarque Bera normality test

Jarque-Bera normality test	1.537
Chi(2)	0 .4636

Jarque-Bera test for Ho: normality:

Source: Author Constructed

To assess the normality of the data, Jarques-Bera Normality test was conducted, which revealed a Chi (2) of 0.4636. Since the value is higher than 0.05, it indicates that the data taken for the study are normally distributed.

Multicollinearity test

Table 4 presents multicollinearity among the variables.

Table 4. Variance Inflation Factor (VIF)

Variable	VIF	1/VIF
LTA	5.04	0.198363
LTD	4.52	0.221113
CAR	1.31	0.761333
NPL	1.06	0.944770
Mean VIF	2.98	

Source: Survey data

The above table 4 reveals that there is no multicollinearity among explanatory variables as VIF is less than 10 for all variables.

Heteroscedasticity test

Following Table 5 presents the Heteroscedasticity by testing whether error term has a constant value.

Table 5. White test

chi2 (14) =	20.41
Prob > chi2 =	0.1176

Source: Author Constructed

Since the P value of Chi 2 is less than 0.05, it is confirmed that there are no Heteroscedasticity errors in the study.

Regression Analysis

The results of the random effects model are shown in Table 6.

Table 6. Random-effects GLS regression analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	.2468459	.0890522	2.77	0.006
NPL	-2.847791	.3233871	-8.81	0.000
LTA	.4956868	.1681337	2.95	0.003
LTD	-.4203746	.1255886	-3.35	0.001
CAR	.3310117	.3555913	0.93	0.352
Wald chi2(4)	85.94	Prob > chi2		0.0000

Source: Survey data

Random effect model is utilized when error terms are linked and allow time invariant variables to work as independent variables by assuming error is not connected with predictors. To test the hypotheses, Random effect model is executed which revealed Wald chi2 of 85.94 with a probability of 0.0000 which is less at the significance level of 0.05.

Table 7. Fixed-effects regression analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	.1845034	.115078	1.60	0.125
NPL	-3.10739	.554205	-5.61	0.000
LTA	.170914	.2662688	0.64	0.528
LTD	-.1759339	.1798365	-0.98	0.340
CAR	.8230454	.5695256	1.45	0.164
F(4,20)	11.19	Prob > F	0.0001	

Source: Survey data

Fixed effect model uses the net effect of independent variables to determine the dependent variable and allows to avoid the time invariant attributes. The analysis revealed the F value of 11.19 with a probability of 0.0001 which is significant at the level of 0.05.

Next, Hausman test was performed.

Table 8. Hausman test

chi2 (4)	=	4.46
Prob > chi2 =	0.3474	

The Hausman test produced chi 2 of 4.46 with a probability of 0.3474 which is higher at the significance level of 0.05. This confirmed random model is the preferred model.

As the next step, Pooled OLS and Breusch and Pagan Lagrangian multiplier test are performed to check whether Pooled OLS or Random model is most suitable for the study.

Table 9. Pooled Ordinary least squares regression analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	.2468459	.0890522	2.77	0.010
NPL	-2.847791	.3233871	-8.81	0.000
LTA	.4956868	.1681337	2.95	0.007
LTD	-.4203746	.1255886	-3.35	0.003
CAR	.3310117	.3555913	0.93	0.361
R-squared	0.7747	F-statistic	21.49	
Adjusted R-squared	0.7386	Prob(F-statistic)	0.0000	

Source: Survey data

Table 10. Breusch and Pagan Lagrangian multiplier test

chibar2 (01) =	0.00
Prob > chibar2 =	1.0000

Test of Breusch and Pagan Lagrangian multiplier revealed that probability of chi bar 2 is 1.0000 which is higher than 0.05, therefore, Pooled OLS is selected for the study.

Pooled OLS analysis revealed that Coefficient of determination (Adjusted R2) of the analysis was 0.7386 which disclosed approximately 74% of variability in profitability is explained by dependent variables which are taken for this study namely NPL, LTA, LTD and CAR and other remaining 26% variability is explained by other variables which are not considered in the study.

Furthermore, the F statistic of the study is 21.49 and the p value is 0.0000 which is lesser than 0.00 (5% level of significance). Therefore, it can be concluded that the the model is perfectly fitting for this study.

The results revealed that there is a significant negative impact from NPL on profitability which is in line with most of the empirical evidences (Munangi & Sibindi, 2020; Bandara et al., 2021; Rahman et al., 2016; Personal et al., 2010). When the proportion of NPL increases, credit risk also increases, which is associated with potential losses to banks, leading to a negative impact on the profitability. Further, banks may allocate more provisions to reserve to face this kind of situation, which decreases income and ROE. Furthermore, the LTD ratio shows a negative relationship with ROE, which contracts with the results of Bandara et al. (2021) who concluded there was an insignificant relationship between both variables. This can also be justified when there is a high proportion of loans compared to deposits even though it increases interest income, it may also expose the banks to greater risks of loan defaults, eventually leading increased NPLs and negatively affecting ROE. On the other hand, LTA has a positive relationship with ROE. This positive effect may be when the LTA is within a certain level, as a higher LTA can increase interest income. By evaluating and managing credit risks effectively, banks can generate higher income without significantly increasing the likelihood of defaults. These results align with the findings of Rahman et al (2016). However, CAR does not have a significant impact on profitability. This could be because this ratio directly links with the bank's capital adequacy and ability to

absorb the risks. While a higher CAR is important to fulfill the requirements of financial stability and regulatory compliance, this may not directly link with ROE. However, this contradicts with the results of Bandara et al. (2021) and Munangi and Sibindi (2020), where they confirmed a positive significant relationship.

Conclusion

This study examines impact of credit risk on the performance of LCBs in Sri Lanka. For this purpose, Six Systematically Important Banks (SIBs) were selected for the period of 2017 to 2021. To analyse the credit risks of the LCBs, metrics such as NPL, CAR, LTA, LTD are employed, while performance is measured by using ROE. Based on the diagnostic tests, it is confirmed that data taken for analysis are normally distributed, there is no multicollinearity among explanatory variables, and there are no Heteroscedasticity errors. From fixed, random and Pooled OLS tests, the study revealed that Pooled OLS is the most suitable to test the impact of credit risk on profitability. The results revealed that there is a significant negative impact from NPL and LTD on the profitability of Licensed Commercial Banks which highlights the importance of effectively managing credit risks to safeguard the banks' financial health and ensure sustained profitability. Conversely, LTA has a significant positive impact within certain limits, suggesting that maintaining an optimal balance between loans and assets can enhance the interest income without unnecessarily increasing the default risks. However, CAR does not have a significant impact on profitability, indicating that while maintaining adequate capital levels is important for financial stability and regulatory compliance, it may not directly translate into improved profitability. Therefore, the study ensures a profound relationship between credit risk and the performance of banks and recommends banks to assess and implement credit risk measuring tools to ensure

performances are not deteriorating. This includes implementing robust risk assessment tools, closely monitoring NPL ratios, optimizing loan to deposit ratios within the hurdle and ensuring prudent asset allocation to maximize profitability while mitigating credit risks. Furthermore, ongoing evaluation and refinement of credit risk management strategies are important to adopt to evolve market conditions and regulatory requirements. Hence, this study assists to take informed decisions not only by banks but also by the central bank, government, other financial regulatory bodies, economists and researchers. By proactively addressing credit risk challenges, banks can foster greater financial stability, support economic growth and enhance shareholder/owners value in the long run.

Limitations and Scope for future studies

This study only considers six Systematically Important Banks, which represent 53% of the market. However, there are 24 licensed commercial banks. Further, only five-year periods are covered. Future researchers can increase the data span by adding more banks and time periods. For the analysis NPL, CAR, LTA, LTD are only taken as independent variables. There are other variables such as net charge-off rates and pre-provision of profit as a percentage of overall new loans and advances can be employed. Firm size and age might be added as control variables. Currently, only ROE is used to measure performance. Future researchers may consider using ROA, Economic Value Added and net interest margin. As additional measures.

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