The Influence of Asset Quality on Financial Performance: Evidence from Sri Lankan Banking Industry

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Abstract

The banking industry of Sri Lanka is now being burdened by the increasing levels of Non-Performing Loans (NPLs) during and after the COVID-19 and subsequent economic crisis. The objectives of this study were to investigate the influence of asset quality on the financial performance of the banking industry and to identify the relationship between asset quality and the financial performance of the banking industry in Sri Lanka. The asset quality was measured by the Net NPLs to Total Loans and Advances (NNPLTLA), Total Provision Coverage Ratio (TPCR), Foreign Currency Denominated Loans to Total Loans and Advances (FCDLTLA) and Investments to Total Assets (ITA). The financial performance was measured by the Return on Assets (ROA), Return on Equity (ROE), Efficiency Ratio (ER) and Net Interest Margin (NIM). The data was extracted from the data sheets of Central Bank of Sri Lanka (CBSL) spanning the period from the year 2008 Quarter 1 to 2021 Quarter 3. For this purpose, a time-series data of 55 observations was used. An exploratory research design was adopted in this study. The analysis revealed that NPLTLA was statistically significant and negatively influenced on ROA and ROE. The NPLTLA was statistically significant and positively influenced on ER and NIM. The FCDLTLA was statistically significant and negatively influenced on ROA, ROE and NIM while negatively insignificant on ER. The results further indicated that the TPCR had insignificantly related with ROA, ROE and ER and statistically significant and positively influenced on NIM. The ITA had insignificantly influenced on ROA and ROE. The ITA significantly and negatively influenced on ER and Nim. The findings of this study will be useful to the banks of Sri Lanka, equity investors and future researchers since it uses the time series data of banking industry to investigate the influence of asset quality on profitability.

Introduction

The efficiency of the banking industry of an economy is vital for the stability of the entire financial system (Richard, Sibindi & Jeke, 2023). After the 2007 - 2008 financial crisis, the banking industry of the countries are trying to improve their financial performance by changing their operating environment (Gathara, Mutwiri & Aluoch, 2023). As per the International Monetary Fund (IMF), the data of asset quality shows that however there is no official acceptable limit of gross non-performing assets, it can be manageable if the banking industry in any country has non-performing assets below the 3% and closer to 1% of assets. The finest asset quality of banks is maintained in Canada at 0.4%, Republic of Korea at 0.50% and Switzerland at 0.6%. The struggling countries due to the higher component of bad loans are Ukraine at 54.3%, Greece at 44.1% and Cyprus at 36.4% (Srinivasa, 2022). The banking industry of Sri Lanka is now hampered with weight of increasing Non-Performing Loans (NPLs) during and after the COVID - 19 and subsequent economic crisis. A total of Rs. 1.6 trillion with the interest should be paid by individuals, business organizations and small and medium enterprises to the local banking industry as at 31st of March, 2023 (CBSL, 2022).

The asset quality of banks is always connected to the quality of loans provided by the banks. The quality of loans of the banks can be measured by the NPLs (Eyup, Niyazi & Nurcan, 2017). The loan portfolio is the main asset of commercial banks from which the income is generated since it determines the profitability of banks. The capital position of the banks is enormously influenced due to the increased level of NPLs and as a consequent, the institutions to oblige higher provisioning of loan - loss. The huge changes in reserves of loan - loss rising because of the higher provisioning might show a worsening situation of the loan portfolio that can be a vast deterrent in the possible performance in the future affecting the shareholders' wealth (Lancaster, Hatfield & Anderson, 1993 and Thakor, 1987 as cited in Mohapatra & Misra, 2019). This impacts more forceful if the higher level of loan - loss provisioning is attended by a reduction in operating profits (Docking et al., 1997, as cited in Mohapatra & Misra, 2019). The highest risk that is being faced by a bank is the losses derived from unsettled loans. As a consequent, the ratios of NPLs are the finest proxies to measure the asset quality of banks. Therefore, it is the main alarm of all commercial banks to maintain the sum of NPLs at a lower level (Nicholas, Tobias & Maurice, 2019 and Mohapatra & Misra, 2019).

The research problem is identified after the thorough review of related literature, which subsequently is followed by research

questions, objectives of the study and the research gap. The asset quality is a facet of bank management that requires the assessment of their assets in order to enable the measurement of the credit and financial risks pertaining to its operations since their assets are exposed to determine the potential losses (Abata, 2014 as cited in Lucky & Nwosi, 2017). On the one hand, the increased loan quality will enhance the returns but at the it will reduce the opportunity of failure of a manageable cost (Ronald, 2016). The lower assets quality over the NPLs may lead to bankruptcies of banks as evidenced by the 2007 – 2008 financial crisis (Adhikary, 2006 as cited in Sanathanee, 2020). The asset quality of banks impacts their financial performance. For example, Sanathanee (2020) explored a study to examine the impact of asset quality on the profitability of 9 commercial banks in Sri Lanka for the period of 8 years from 2008 to 2016 and found that asset quality had a negative insignificant impact on the profitability of the banks. Nicholas, Tobias & Maurice (2019) evidenced that the NPLs were influenced financial performance of banks in Kenya. Eyup, Niyazi & Nurcan (2017) found that NPLs had significantly and negatively impacted on the profitability of banks as measured by ROA and ROE. Peter, Samuel & Kennedy (2022) found that the asset quality had contributed significantly and positively on NIM and insignificantly impacted on ROA and ROE.

Based on the preceding discussions of the research problem, following research questions have been addressed: what would be the influence of asset quality as measured by the net NPLs to total loans and advances, total provision coverage ratio, foreign currency denominated loans to total loans and advances investments to total assets on the financial performance of the banking industry in Sri Lanka? And what is the relationship between asset quality and the financial performance of the banking industry in Sri Lanka? Based on the literature review, the research problem identified, and addressing the research questions above, this study sets out to achieve the following objectives: to investigate the influence of asset quality as measured by the NPLs to total loans and advances, total provision coverage ratio, foreign currency denominated loans to total loans and advances investments to total assets on the financial performance of the banking industry in Sri Lanka. And to identify the relationship between asset quality and the financial performance of the banking industry in Sri Lanka. This study would assist the banks of Sri Lanka, equity investors and future researchers since it uses the time series data of banking industry to investigate the influence of asset quality on profitability.

The remainder of the paper was structured as follows: The following section shows the literature review. The next sections describe the methods and pronounces the results and

analysis. The conclusion is explained in the last section.

Literature review

This section reviewed the relevant literature theoretically and empirically and identifies the research gap.

Theoretical framework

Profit theory: Knight's diary (as cited in Olabanjo, 2018) explained that the asset quality has inherent risks that may lead to harm the profitability of banks. Therefore, profit theory affords a clear theoretical explanation of the relationship between the asset quality related variables and profitability related variables.

Signaling theory: The signaling theory pronounces that why companies should report financial information voluntarily. If lenders and other creditors have proper information about the financial stability of the company, it will enable the company to form high capital. The financial information directs signals to lenders and other creditors to lower the cost of capital (Van Horne & Wachowicz, 2005 as cited in Ronald, 2016). In accordance with the signaling theory, higher capital leads positive signals to the market on the worth of the banks. The positive signals afford private information to the bank so as to permit it to improve its capital based on its potentials. Further, the signaling theory is applicable to this study

because the bank management directs the signals which stimulus the expectations of potential investors (Allee & Yohn, 2009 as cited in Ronald, 2016).

As per the foregoing discussions, as per the milieu of commercial banks, the signaling theory is more appropriate as it describes how the banks signal their financial stability and their soundness to current and potential investors, depositors and regulators. For an instance, a bank that maintains a higher level of liquidity and capital signals that it is financially sound, in contrast, a bank that maintains a higher levels of NPLs signals financial complications (Gathara, Mutwiri & Aluoch, 2023).

Empirical review

In assessing asset quality of banks, research by Sangmi and Nazir (2010) advised that to keep their amount of NPLs to low levels by commercial banks since the loans affect the financial performance. On the banking crisis in Kenya, a study by Waweru and Kalani (2008) found that NPLs mostly lent to insiders and politicians were the main cause of the stream of Kenyan bank failures in 1986. Nyanga (2012) states that the bank assets composed of fixed and current assets, and credit portfolios among the other investments. The loans comprised the major part of a bank's assets and lead to higher risks to their capital. Ronald (2016) investigated study on the effect of asset quality on profitability of 43 commercial banks in

Kenya. The analysis found that there is a positive relationship between asset quality and profitability of commercial banks and also revealed that when the ratio of non-performing asset to net assets is lower, asset quality of commercial banks will have trade-off between assets quality and profitability and concluded that there is a positive relationship between capital adequacy and profitability of commercial banks.

A study explored by Saqib, Muhammad, Muhammad and Sahar (2017) identified the effect of bank specific factors comprising of bank asset, capital adequacy ratio, cost of funds, ROA, credit to deposit ratio, bank credit growth rate, operating expenses to total assets and macroeconomic factors using a panel data set of 25 commercial banks from Pakistan with 225 observations spanning the period from 2006 to 2014. The study shown that bank assets, cost of fund, credit to deposit rate, bank lending and exchange rate had statistically significant impact on non-performing assets. The capital adequacy ratio, gross non-performing asset, credit to deposit ratio and bank asset also had significant impact on profitability of Pakistani commercial banks.

The evidence obtained by Eyup, Niyazi & Nurcan (2017) of the negative impact of asset quality as measured by NPLs on profitability as measured by ROA and ROE of the 55 banks in Turkey based on the data during the sample period from the year 2005 Quarter 1 to 2016 Quarter 3 for observations of 1809.

In line with the findings of this study, for the Asian banks, Nimesh and Biao (2018) examined the determinants of profitability with the role of asset quality using the fixed effect model of the panel data consisting of 947 banks from 12 Asian economies spanning the period from 2001 to 2015. The analysis revealed that poor asset quality as measured by impaired loans over gross loans had significantly negative impact on banks' financial performance.

For a fifteen (15) quoted commercial banks, Lucky & Nwosi (2017) examined the relationship between asset quality and the profitability of a Nigerian perspective from 1980 to 2013. The findings of the study proved that percentage of NPLs to total loans and the percentage of NPLs to total customers' deposits had positive relationship with ROI and percentage of loan loss provision to total loans and the percentage of loan loss provision to total asset had negative relationship with ROI of the quoted commercial banks in Nigeria. Using an archival financial data, Olabanjo (2018) studied the relationship between liquidity, asset quality, and profitability of 16 mortgage banks in Nigeria covering a period of 8 years from 2009 to 2016 and found that liquidity and asset quality significantly influenced on NIM and ROA.

Febrio and Maria (2019) investigated a study on asset quality, non - interest income and profitability of Indonesian banks for the period from 2007 to 2016 of 31 state-owned,

52 privately owned, and 26 foreign banks. The study found that a positive impact of income diversification on NIM and ROA and risk-adjusted ROA.

Faizah and Burhany (2019) examined the whether assets quality and capital have the impact on credit risk and profitability of conventional and Islamic banks in Indonesia adopting purposive sampling method for 29 conventional banks and 10 Islamic banks. The results revealed that the assets quality had significant and positive impact on profitability in conventional banks, but had a negative impact on Islamic banks. The capital had positive and significant impact on profitability in conventional banks. The credit risk had negative and significant impact on financial performance of both types of banks in Indonesia.

Nicholas, Tobias & Maurice (2019) examined and assessed the banks' asset quality and financial performance of the 11 banks in Kenya listed in the Nairobi Securities Exchange of the six-year period from 2012 to 2017. The tests revealed that asset quality had a statistically significant relationship and impact on banks' profitability. Mohapatra and Misra (2019) examined the asset quality as measured by the percentage change in Gross NPLs, provisioning ratio and capital to risk weighted asset ratio. The study revealed that the investors look forward to bank-specific factors such as banks' profitability proxies, valuation ratios, asset quality and leverage ratios prior including the stocks in the portfolio.

Using a parsimonious model, David and Robert (2019) explored a study to identify the impact of asset quality for the period of 7 years from 2008 to 2014. The analysis found that a one percentage increase in the impairment ratio will reduce the short run pass-through by 3%. And derived a measure of the hidden bad loan problem, the NPLs gap as the excess of NPLs over impaired loans. The tests further found that there was a significant role in the fragmentation of euro area pass-through post-crisis. Nicholas, Margaret, Joseph & Michael (2021) examined the causal relationship between intellectual capital and asset quality of banks in Ghana using the financial statements of 24 banks from 2006 to 2015. The ratio of NPLs to gross loans and advances was proxied to measure the asset quality growths and the value-added intellectual coefficient was used to measure the intellectual capital using the panel data. The tests found that asset quality of banks is mostly not influenced by intellectual capital. Though, when intellectual capital is separated as components, the study found that there were significant positive relationships between asset quality and components of intellectual capital.

Ni (2020) examined the commercial banks listed in Indonesia Stock Exchange and found loan to deposit ratio and NPLs had negative impact on ROA. Peter, Samuel & Kennedy (2022) analyzed the effect of

financial soundness on financial performance of commercial banks in Kenya using a dynamic panel model for the period of 12 years from 2009 to 2020 adopting the CAMEL variables as financial soundness indicators and net interest margin, earnings per share, ROA and ROE as measures of financial performance. The study found that financial soundness had a statistically significant impact on NIM, ROA and ROE. Further, the analysis also found that asset quality and earning quality had a statistically significant effect on NIM and capital adequacy, asset quality, earning quality and liquidity had statistically insignificant impact on ROA and ROE. The capital adequacy, management efficiency and liquidity had statistically insignificant impact on NIM.

Adopting the system generalized method of moments, Fredrick and Bo (2022) examined the effect of capital adequacy and asset quality on banking sector performance in 12 Nigerian banks using panel data for the period from 2010 to 2019. The findings revealed that capital adequacy and asset quality positively impacted on bank performance. Oleg, Aristeidis, Giulia and Richard (2022) investigated the impact of banks' ability to minimize costs on asset quality, by assessing the temporal relationship between the variables of Italian banks for the period of 10 years from 2006 to 2015. The results found that NPLs distressing Italian banks can be enlightened by efficiency components. A decrease in short-term cost efficiency leads a worsening in banks' asset quality. Using generalized method of moments model for a panel data from 18 universal banks spanning the period of 2007 to 2021, Richard, Sibindi & Jeke (2023) assessed the dynamic relationship between macroeconomic factors and bank asset quality based on changes in the condition of stock market returns. The analysis revealed that the real GDP growth rate, the average lending rate and the real exchange rate impacted on banks' asset quality. A positive relationship was existed between the market return improvement and banks' asset quality. Gathara, Mutwiri and Aluoch (2023) investigated a study on the effect of asset quality on commercial banks value in 43 commercial banks in Kenya for 7 years from 2014 to 2021. The study revealed that asset quality had a positive impact on the commercial banks value.

In this context, this study is justified because most of the extant studies have used panel data set to analyze the impact of asset quality on banks' performance. The current study is modeled on the concept of the asset quality by employing the variables as Net NPLs to Total Loans and Advances (NNPLTLA), Foreign Currency Denominated Loans to Total Loans and Advances (FCDLTLA), Total Provision Coverage Ratio (TPCR), and Investments to Total Assets (ITA) as the measurement for asset quality. This study therefore contributes to the literature relating to the banking industry in Sri Lanka.

Hence this study sought to analyze whether asset quality had an influence in financial performance of banking industry in Sri Lanka. In addition to the ROA, this study also used net interest income to the gross interest income ratio and efficiency ratio as the measurements for the profitability of the banks. But prior studies were commonly used the ROE and NIM as the main measurements for the banks' profitability. Having considered all the above, the data were analyzed whether the asset quality of the banks are contributing as the significant determinants of profitability of the banking industry. Thus, this study fulfills the research gap. The next section elaborates on the methodology employed in this study.

Methods

Research design, sample selection and data

This study is quantitative research. The explanatory research design was adopted which helps to explain why phenomena occur whilst describing longitudinal research which feature analyses on time series data spanning the sample period from the year 2008 Quarter 1 to 2021 Quarter 3. The data has been collected from the website of the Central Bank of Sri Lanka (CBSL). A time-series data of 55 observations from the year 2008 Quarter 1 to 2021 Quarter 3 was used.

The gathered data were analyzed through the E -Views package. The descriptive statistics, data diagnostics tests like Unit root test, Breusch-Godfrey Serial Correlation LM Test, Breusch-Pagan-Godfrey Test and inference statistics like bivariate analysis, and multiple regression analysis were performed.

Conceptual model

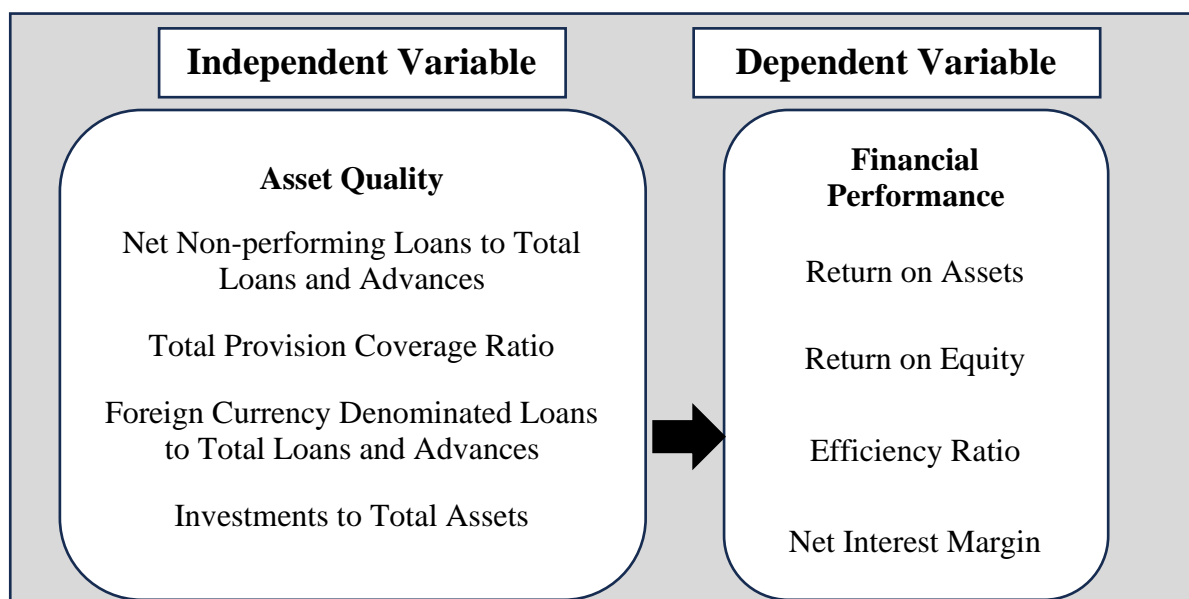The following conceptual model has been developed:

Figure No.2-Conceptual Framework developed by the Author based on the Literature review.

Operationalization and measurement of variables

This study employed four indicators as asset quality proxies as recommended by CBSL.

Four financial performance measures were employed to measure the dependent variables. The operational definition of variables is described in the following table:

Table No. 1: Operationalization and measurement of variables

Concept	Variables and Acronym	Measurement
Dependent Variable (Financial Performance)	Return on Assets **(ROA)**	Profit after tax/ Total Assets
	Return on Equity **(ROE)**	Profit for the year/ Total Equity
	Efficiency Ratio **(ER)**	Non-interest expenses to (gross income + recoveries - specific provision charged to income - write off – provision)
	Net Interest Margin **(NIM)**	Net Interest Income /Average Assets
Independent Variable (Asset Quality)	Net NPLs to Total Loans and Advances **(NNPLTLA)**	Net NPLs/ Total Loans and Advances
	Foreign Currency Denominated Loans to Total Loans and Advances **(FCDLTLA)**	Foreign Currency Denominated Loans / Total Loans and Advances
	Total Provision Coverage Ratio **(TPCR)**	The ratio of specific provisions and general provisions to non-performing advances net of interest in suspense
	Investments to Total Assets **(ITA)**	Investments in Treasury bills, Treasury bonds, Sri Lanka development bonds, investment in shares, unit trusts, debt securities and investments in subsidiaries, associates, and joint ventures / Total Assets

Hypotheses of the study

The following hypotheses were formulated:

H_{1a-d}: There is a significant impact of asset quality on ROA.

H_{2a-d}: There is a significant impact of asset quality on ROE.

H_{3a-d}: There is a significant impact of asset quality on ER.

H_{4a-d}: There is a significant impact of asset quality on NIM.

Econometric model

The following model to identify the relationship between each dependent variable and independent variables is generated for the estimation purposes of the study:

Model 1:

$$ROA = \beta_0 + \beta_1 NNPLTT + \beta_2 FCDLTLA + \beta_3 TPCR + \beta_4 ITA + \varepsilon$$

Model 2:

$$ROE = \beta_0 + \beta_1 NNPLTT + \beta_2 FCDLTLA + \beta_3 TPCR + \beta_4 ITA + \varepsilon$$

Model 3:

$$ER = \beta_0 + \beta_1 NNPLTT + \beta_2 FCDLTLA + \beta_3 TPCR + \beta_4 ITA + \varepsilon$$

Model 4:

$$NIM = \beta_0 + \beta_1 NNPLTT + \beta_2 FCDLTLA + \beta_3 TPCR + \beta_4 ITA + \varepsilon$$

β_0: Regression Intercept, Refer to the operationalization of variables.

ε: Error term

Diagnostic tests

This study adopted different diagnostic tests to confirm the data was fit for the model. The normality test proved that the data came from normally distributed time series set. The Augumented Dickey – Fuller unit root test was performed to check the stationary. The Variance Inflation Factor figures were used to check whether multicollinearity problem exists among the independent's variables. In addition, Breusch - Godfrey Serial Correlation LM Test was used to check the serial correlation problem. The Breusch – Pagan - Godfrey test proves that the residuals obtained are free from heteroscedasticity. It refers to the residuals are homoskedasticity, which makes the models fit.

Results and Discussions

The descriptive statistics and the inference statistics are presented in this section.

Table 2 shows the mean of NNPLTLA was 4.84 with a standard deviation of 1.61. This implied that NNPLTLA stood at 484.98% with an average deviation of 161.53%. The NNPLTLA fluctuated from a minimum of 2.49 to a maximum of 8.83 implying that banking industry of Sri Lanka kept fluctuating the ratio of NNPLTLA as a result of banking operations. The mean of FCDLTLA was 59.83 with a standard deviation of 3.52. This implied that the level of FCDLTLA stood at 5,983.14% fluctuating at average of 352.32%. This indicated high level of FCDLTLA in the banking sector during the period of study. In addition, the maximum asset quality attained 65.28

implying a strong FCDLTLA in the banking sector of Sri Lanka.

Table 2: Descriptive Statistic

	NNPLTLA	FCDLTLA	TPCR	ITA	ROA	ROE	ER	NIM
Mean	4.84	59.83	54.64	27.26	1.33	16.07	50.96	3.80
Median	4.69	60.30	53.98	27.34	1.32	16.16	51.77	3.67
Max	8.83	65.28	71.75	33.28	2.21	27.16	57.88	4.59
Min	2.49	52.98	36.81	22.63	0.88	10.05	42.35	3.13
SD	1.61	3.52	7.96	2.86	0.30	3.72	3.44	0.41
Skew	0.75	-0.25	0.01	0.22	0.60	0.43	-0.36	0.41
Kurtos	3.11	1.99	2.67	2.07	3.16	3.27	2.70	2.18
Prob	4.84	59.83	54.64	27.26	1.33	16.07	50.96	3.80

Note: Please see Table 1 for a profile of variables.

The mean value of TPCR ratio was 54.64 with a deviation of 7.96. This indicated that TPCR stood at 5,464.75% deviating at 796.32%. The minimum and maximum values of TPCR reported were 36.81 and 71.75 respectively implying that TPCR ranged widely. The mean value of ITA was 27.26 with a standard deviation of 2.86. This implied that commercial banks' average earning quality was 2,726.84% deviating at 286.36%. The minimum and maximum values of ITA reported were 22.63 and 33.28 respectively.

The average ROA was 1.33 with a deviation of 0.30. This implied that the average ROA was 133.83%. This finding indicated that the average ROA remained above the minimum recommended level. The minimum and maximum value of ROA were 0.88 and 2.21 respectively. The average ROE was

1,607.51% with an average deviation of 372.56%. The minimum ROE reported was 10.05 which was a good indicator in terms of financial performance. The average ER was 50.96 which deviated by 344.89%. The deviation was attributed to the banking sector's poor efficiency. Further, it shows average NIM as 380.13% which deviated by 41.25%. This implied a higher financial performance. In addition, NIM ranged from a minimum of 3.13 to a maximum of 4.59. The Skewness and kurtosis are considered data is normally distributed.

The result of the unit root test is depicted in Table 3. As revealed, all variables employed in the study are stationary since the ADF Statistics is less than the critical values at 5% and significant. It was noted that the first differences of FCDLTLA and ITA are used for further statistical analysis.

Table 3: Unit root test

| Variables | Level | | | First Difference | | | Order of I |
	Constant	Constant and trend	None	Constant	Constant and trend	None	
NNPLTLA	-3.27**	-2.56	-1.83	-4.35***	-4.68***	-4.32***	I(0)
FCDLTLA	-1.38	-1.34	-0.85	-6.32***	-6.40***	-6.32***	I(1)
TPCR	-3.12**	-3.42	0.81	-1.92	-5.18***	-1.80	I(0)
ITA	-1.72	-0.98	-0.98	-5.14***	-5.03***	-4.73***	I(1)
ROA	-2.58	-2.84	-0.42	-7.95***	-7.75***	-7.585***	I(0)
ROE	-2.67	-3.43	-0.64	-8.31***	-7.91***	-7.86***	I(0)
ER	-3.57**	-3.62*	-0.58	-7.87***	-7.79***	-7.92***	I(0)
NIM	-2.74	-4.64	0.30	-9.42	-9.11	-9.55	I(0)

Notes: Augmented Dickey-Fuller (ADF) test (t) statistics are provided with the statistical significance level ** and *** indicate at the 5% and 1% respectively; Please see Table 1 for a profile of variables.

Table 4: Test of Multicollinearity

Independent variables	VIF
NNPLTLA	3.03
FCDLTLA	3.80
TPCR	2.20
ITA	2.26

Note: Please see Table 1 for a profile of variables.

Table 5: Breusch-Godfrey Serial Correlation LM Test

	ROA	ROE	ER	NIM
F-statistic	6.15	5.62	8.47	5.00
Obs*R-squared	11.80	13.45	15.01	10.01
Prob. F(2,46)	0.05	0.05	0.05	0.05
Prob. Chi-Square(2)	0.05	0.05	0.05	0.05

Null hypothesis: No serial correlation at up to 2 lags

Note: Please see Table 1 for a profile of variables.

According to Table 4, VIFs are not exceeded 10 and variables are not signing of serious multicollinearity. According to Table 5, the prob. F(2,44) and prob. Chi-Square(2) obtained for the models for ROA, NIIGI, and ER are greater than 0.05. The Breusch-Godfrey serial correlation LM test proves that the residuals obtained are free from serial correlation.

Table 6: Breusch-Pagan-Godfrey Test

	ROA	ROE	ER	NIM
F-statistic	1.46	1.68	0.84	1.05
Obs*R-squared	9.82	8.72	6.14	7.47
Scaled explained SS	20.65	15.43	7.84	3.37
Prob. F(7,47)	0.20	0.64	0.55	0.40
Prob. Chi-Square (7)	0.19	0.26	0.52	0.38
Prob. Chi-Square (7)	0.18	0.23	0.34	0.84
	Null hypothesis: Homoskedasticity			

Note: Please see Table 1 for a profile of variables.

According to the Table 6, the Prob. F(7,46), and prob. Chi-Square (7) obtained for the models for ROA, NII TO GI, and ER are greater than 0.05. The Breusch-Pagan-Godfrey test proves that the residuals obtained are free from heteroscedasticity. It refers to the residuals are homoskedasticity, which makes the models fit.

Corelation analysis

The bivariate analysis has been performed an presented in the table 7:

Table 7: Corelation analysis

	NNPLTLA	FCDLTLA	TPCR	ITA	ROA	ROE	ER	NIM
NNPLTLA	1							
FCDLTLA	-0.57***	1						
TPCR	-0.48	0.38***	1					
ITA	0.47***	-0.84***	-0.21	1				
ROA	-0.14	-0.35***	-0.01	0.30**	1			
ROE	-0.14	-0.40***	0.04	0.34***	0.99***	1		
ER	0.34**	-0.11	-0.38***	-0.06	-0.67***	-0.66***	1	
NIM	0.49***	-0.47***	-0.04	0.27**	0.39***	0.42***	-0.04	1

Note(s): *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Please see Table 1 for profile of variables.

The Pearson's bivariate analysis shows the relationship between the two variables. According to Table 7, it is noted that NNPLTLA had a weak negative relationship with ROA and ROE and had a weak positive relationship with ER and NIM. The FCDLTLA had a weak tive relationship with ROA, ROE, ER and NIM. The TPCR ratio had a weak negative relationship with ROA, ER and NIM and a weak positive relationship with ROE. The ITA had a weak positive relationship with ROA, ROE and NIM and had a weak positive relationship with ROE.

Regression analysis

Table 8: Multiple Regression Analysis

Variables	Model - 1 ROA	Model - 2 ROE	Model - 3 ER	Model - 4 NIM
NNPLTLA	-0.09***	-0.23***	0.66*	0.12***
	(0.02, 3.38)	(0.33, -3.66)	(0.34, 1.93)	(0.03, 3.36)
FCDLTLA	-0.05**	-0.80***	-0.17	-0.09***
	(0.02, 2.52)	(0.24, -3.35)	(0.24, -0.71)	(0.02, -3.70)
TPCR	-0.01	0.03	-0.10	0.02***
	(0.01, 0.18)	(0.06, 0.54)	(0.06, -1.67)	(0.01, 3.03)
ITA	0.01	-0.04	-0.48*	-0.08***
	(0.02, 0.17)	(0.27, -0.14)	(0.27, -1.76)	(0.02, -2.71)
	4.87***	69.67***	77.37***	9.84***
C	(1.76, 2.75)	(20.58, 3.38)	(21.03, 3.67)	(2.15, 4.56)
R^2	0.30	0.37	0.24	0.44
Adjusted R^2	0.24	0.32	0.18	0.39
F-statistic	5.36	7.62	4.02	9.97
Prob(F-stat)	0.00	0.00	0.00	0.00
DW	1.66	1.75	1.91	1.39
Obs.	55			

Note(s): *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

The standard errors and t-statistics respectively are reported in parentheses; Please see Table 1 for a profile of variables.

Influence of asset quality as measured by NNPLTLA on financial performance

Table 08 shows the statistical significance of the independent variables on the three models. The R^2 value of model 1 is 0.24 which indicates that 24% of the variation in model 1 is explained by the variables in model 1. F-statistic for model 1 proves that model 1 was fit since its Prob(F-stat) value is 0.00 which is less than 0.05. Durbin-Watson stat is 1.66 which is closer to 2 infers evidence in favor of no autocorrelation. According to

the multiple regression analysis, the result indicated that NNPLTLA negatively related with ROA, that is, banking industry's ROA would decrease by 9% as a result of a 1% increase in NNPLTLA and their ROE would decrease by 23% as a result of a 1% increase in NPLTT. It further shows statistically significant and negative coefficients of NNPLTLA (-0.09 and -0.23) when ROA and ROE were employed as measures of financial performance respectively. The banking industry's ER would increase by 66% as a result of a 1% increase in NNPLTLA and their NIM would also increase by 11% as a result of a 1% increase in NNPLTLA. It shows statistically significant and positive

coefficients of NNPLTLA 0.66 and 0.12) when ER and NIM were employed as measures of financial performance respectively. This finding confirms the work of Eyup, Niyazi & Nurcan (2017) who observed that percentage of loan loss provision to total loans and the percentage of loan loss provision to total asset had negative relationship with ROA of the quoted commercial banks in Nigeria. The findings also confirmed with Olabanjo (2018) who found asset quality positively and significantly influenced on NIM and of Febrio and Maria (2019) who found that a positive impact of income diversification on NIM.

The finding contradicted the work of Saqib, Muhammad, Muhammad and Sahar (2017), Lucky & Nwosi (2017) who found percentage of NPLs to Total Loans and the percentage of NPLs to total customers' deposits had positive relationship with ROA and Olabanjo (2018), who found that asset quality positively influenced ROA and other works of Fredrick and BO (2022), Gathara, Mutwiri and Aluoch (2023), Faizah and Burhany (2019) who found that asset quality positively influenced profitability. The hypotheses H_{1a}, H_{1b}, H_{1c} and H_{1d} were accepted. Further by using the results of the Table 08, the econometric model for the ROA (model 1) can be expressed as follows:

$$ROA = 4.87 - 0.09NNPLTT - 0.05FCDLTLA - 0.01TPCR + 0.01ITA + \varepsilon$$

Influence of asset quality as measured by FCDLTLA on financial performance

The R^2 value of model 2 is 0.33 which indicates that 33% of the variation in model 2 is explained by the variables in model 2. F-statistic for model 2 proves that model 2 was fit since its Prob(F-stat) value is 0.00 which is at less than 0.05. Durbin-Watson stat is 1.75 which is closer to 2 infers evidence in favor of no autocorrelation. According to the multiple regression analysis, the result indicated that FCDLTLA negatively and statistically related with ROA, that is, banking industry's ROA would decrease by 5% as a result of a 1% increase in FCDLTLA and their ROE would decrease by 80% as a result

of a 1% increase in FCDLTLA. The banks NIM would decrease by 9% as a result of a 1% increase in FCDLTLA. It further shows statistically significant and negative coefficients of FCDLTLA (-0.05, -0.80 and -0.09) when ROA, ROE and NIM were employed as measures of financial performance respectively. Further shows statistically insignificant and negative coefficients FCDLTLA (-0.18) when ER and was employed as measures of financial performance respectively. Therefore, the hypotheses H_{2a} and H_{2b} were accepted while other hypotheses H_{2c} to H_{2d} were rejected. The econometric model for the NII TO GI (model 2) can be expressed as follows:

$$ROE = 69.67 - 0.23NNPLTT - 0.80FCDLTLA + 0.03TPCR - 0.04ITA + \varepsilon$$

Influence of asset quality as measured by TPCR on financial performance

The R^2 value of model 3 is 0.18 which indicates that 18% of the variation in model 3 is explained by the variables in model 3. F-statistic for model 3 proves that model 3 was fit since its Prob(F-stat) value is 0.00 which is less than 0.05. Durbin-Watson stat is 1.92 which is closer to 2 infers evidence in favor of no autocorrelation. According to the multiple regression analysis, the result indicated that TPCR had insignificantly related with ROA, ROE and ER. It further shows statistically significant and positive coefficient of TPCR (-0.02) when NIM was employed as measures of financial performance. The banking industry's NIM would increase by 1% as a result of a 1% increase in TPCR. The findings support with the works of Peter, Samuel & Kennedy (2022) asset quality had statistically insignificant impact on ROA and ROE. This finding contradicts the work of Lucky & Nwosi (2017) who found percentage of loan loss provision to total loans and the percentage of loan loss provision to total asset had negative relationship with ROA of the quoted commercial banks in Nigeria. Therefore, the hypotheses H_{3a} and H_{3d} were accepted while other hypotheses from H_{3b} and H_{1c} were rejected. The econometric model for the ER (model 3) can be expressed as follows:

$$ER = 77.37 + 0.66NNPLTT - 0.17FCDLTLA - 0.10TPCR - 0.48ITA + \varepsilon$$

Influence of asset quality as measured by ITA on financial performance

The R^2 value of model 4 is 0.39 which indicates that 39% of the variation in model 4 is explained by the variables in model 4. F-statistic for model 4 proves that model 4 was fit since its Prob(F-stat) value is 0.0000 which is less than 0.05. Durbin-Watson stat is 1.39 which is closer to 2 infers evidence in favor of no autocorrelation. According to the multiple regression analysis, the result indicated that ITA insignificantly related with ROA and ROE respectively. It further shows statistically significant and negative coefficients of ITA (-0.49 and -0.08) when ER and NIM were employed as measures of financial performance respectively. The banking industry's ER would decrease by 49% as a result of a 1% increase in ITA and their NIM would also decrease by 7% as a result of a 1% increase in ITA. This finding contradicts the work of Ni (2020) who found loan to deposit ratio had negative impact on ROA. Therefore, all the hypotheses H_{4a}, H_{3a}, H_{3c} and H_{4d} were accepted. The econometric model for the ER (model 3) can be expressed as follows:

$$NIM = 9.84 + 0.12NNPLTT - 0.09FCDLTLA + 0.02TPCR - 0.08ITA + \varepsilon$$

The results from the multiple regression were used to discuss the findings in line with the two theories integrated under the literature review. In this study, the researcher's thinking is consistent with the profitability theory as asset quality has inherent risks that may lead to harm the profitability of banks (Olabanjo, 2018) and with the signaling theory as it describes how the banks signal their financial stability and their soundness to current and potential investors, depositors and regulators (Van Horne & Wachowicz, 2005 and Allee & Yohn, 2009 as cited in Ronald, 2016).

Conclusions and policy implications

This study examined the influence of asset quality on financial performance of the banking industry in Sri Lanka. The objectives of this study were to investigate the influence of asset quality on the financial performance of the banking industry and to identify the relationship between asset quality and the financial performance of the banking industry in Sri Lanka. The correlation analysis revealed that NNPLTLA had a weak negative relationship with ROA and ROE and had a weak positive relationship with ER and NIM. The FCDLTLA had a weak tive relationship with ROA, ROE, ER and NIM. The TPCR ratio had a weak negative relationship with ROA, ER and NIM and a weak positive relationship with ROE. The ITA had a weak

positive relationship with ROA, ROE and NIM and had a weak positive relationship with ROE. The multiple regression analysis revealed that NNPLTLA was statistically significant and negatively influenced on ROA and ROE while statistically significant and positively influenced on ER and NIM. The FCDLTLA was statistically significant and negatively influenced on ROA, ROE and NIM while negatively insignificant on ER. The results further indicated that the TPCR had insignificantly related with ROA, ROE and ER and statistically significant and positively influenced on NIM. The ITA was found to be insignificantly influenced on ROA and ROE while significantly and negatively influenced on ER and Nim.

This study is aligned with the profit theory and signaling theory and confirmed that the theoretical assumptions of asset quality with banks performance since the bank management directs the signals which stimulus the expectations of potential investors and other stakeholders. Because of the multicollinearity issue among the independent variables this study only used four proxies as independent variables. The results of the study rise some policy implications that can be taken into attention by policy makers. The future researchers can use the total loans and advances to total assets and specific provision coverage ratio can be used to measure the asset quality.

Recommendations

The findings of the study seem to suggest that the banks of Sri Lanka should maintain the asset quality thoroughly by managing the NPLs in order to improve the financial performances. They should enhance and improve their asset quality by adopting effective risk management strategies through the regular audits, proactive prevention of slippage of assets, executing effective loan review processes, undertaking borrowers to prevent accumulation of overdue, monitoring credit quality, improving the internal credit administration and recover bad loans through persuasion and constant follow - up. The prompt recovery of loans will be the important tool for the sustainability of loan recovery of the banks. The banks should also consider the diversification of loan portfolios. If the banks properly manage their asset quality, they can avoid potential losses and sustain their financial health.

The policymakers should adopt effective management strategies by having employee training and development programs, adopting technology to automate processes and restructuring operations. They should implement diversifying profitable operations by financial innovations in the future. The improvement in asset quality can endure sustainable if the banks monitor the credit management effectively.

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References

CBSL (2022). Financial Stability Review, Central Bank of Sri Lanka.

David, B., & Robert, K. (2019). Bank asset quality and monetary policy pass-through. *Applied Economics*, 51(23), 2501–2521. doi.org/10.1080/00036846.2018.1546953

Eyup, K., Niyazi, T., & Nurcan, O. (2017). Effect of the use of asset quality of bank profitability. *International Journal of Economics and Finance*, 9(7), 60-68.

Febrio, G. T., & Maria, U. (2019). Asset quality, non-interest income, and bank profitability: evidence from Indonesia, Advances in Social Science. Education and Humanities Research, *Proceedings of the Asia-Pacific*

Research in Social Sciences and Humanities Universitas Indonesia Conference (APRISH 2019), 558.

Faizah, I., & Burhany, D. (2019). Assets quality and capital as risk and profitability determinants in banking industry. *Proceedings of the International Conference on Creative Economics, Tourism and Information Management* (ICCETIM 2019) - Creativity and Innovation Developments for Global Competitiveness and Sustainability, 198-204.

Fredrick, I., & BO, O. (2022). Capital adequacy, asset quality and banking sector performance. ACTA Universitatis Danubius, 18(3) 22-32.

Gathara, F., Mutwiri, N., & Aluoch, M. (2023). The effect of Asset quality on the value of commercial banks in Kenya. *International Journal of Current Aspects in Finance*, Banking and Accounting, 5(2),33-48. https://doi.org/10.35942/6tdf9275

Lucky, A. L., & Nwosi, A. A. (2017). 'Asset quality and profitability of commercial banks: evidence from Nigeria'. *Research Journal of Finance and Accounting*, 6(18), 26-34.

Mohapatra, S., & Misra, A. K. (2019). Cross-sectional returns predictability for emerging market banks: A study on Indian banking system. *Cogent Economics & Finance*, 7:

https://doi.org/10.1080/23322039.2019.1586078

Ni, K. A. F. P. (2020). Do liquidity, asset quality, firm size, and efficiency affect bank profitability? evidence from Indonesia Stock Exchange. *The 1ˢᵗ International Conference on Business and Engineering Management, Journal of Proceedings Series,* 317-321.

Nicholas, A., Margaret, M. L., Joseph, M. O., & Michael, E. A. (2021). Intellectual capital and asset quality in an emerging banking market. *Asian Journal of Accounting Research*, 6(1),55-68. doi 10.1108/AJAR-05-2020-0034

Nicholas, K. S., Tobias, O., & Maurice, S. (2019). Asset quality as a determinant of commercial banks financial performance in Kenya. *International Journal of Economics, Commerce and Management*, 7(2),413-424.

Nimesh, S., & Biao, A. (2018). Determinants of bank's profitability: role of poor asset quality in Asia, China Finance Review International, 8(2),216-231. doi 10.1108/CFRI-10-2016-0118

Nyanga, L. (2012). Factors influencing adoption and area under conservation agriculture: A mixed methods approach. *Sustainable Agriculture Research*, 1(2).

Olabanjo J, O. (2018). Relationship between liquidity, asset quality, and profitability of mortgage banks in Nigeria, Walden University.

Oleg, B., Aristeidis, D., Giulia, F., & Richard, S. (2022). The impact of efficiency on asset quality in banking. *The European Journal of Finance*, 28(6),596–620. https://doi.org/10.1080/1351847X.2021.1946117

Peter, N. K., Samuel, N. K., & Kennedy, N. O. (2022). Financial soundness and performance: evidence from commercial banks in Kenya. *African Journal of Economic and Management Studies*, 14(4),651-667.

Ronald, K. C. (2016). The effect of asset quality on profitability of commercial banks in Kenya, Thesis, Master of Business Administration, University of Nairobi, http://erepository.uonbi.ac.ke/handle/11295/99114

Richard, A., Sibindi, A., & Jeke, L. (2023). Effect of macroeconomic dynamics on bank asset quality under different market conditions: Evidence from Ghana. *Risks 11*: 158,1-15. https://doi.org/10.3390/risks11090158

Saqib, M., Muhammad, I., Muhammad S., T., & Sahar, S. (2017). Determinants of bank asset quality and profitability.

Journal of Managerial Sciences, 9(3),201-222.

Sangmi, S., & Nazir, M. (2010). Analyzing financial performance of commercial banks in India: Application of CAMEL Model. 4(1),40-55.

Sanathanee, P. D. M. (2020). "The impact of asset quality on profitability: A panel data analysis of domestic commercial banks in Sri Lanka". Central Bank of Sri Lanka – Staff Studies, 50(1),73-97. http://doi.org/10.4038/ss.v50i1.4722

Srinivasa, R. K. (2022). Asset quality in banks: looking far beyond bad banks, *Economic and Political Weekly (Engage)*, 57(10), 1-10.

Waweru, N., & Kalani. N. (2008). Commercial banking crises in Kenya: Causes and remedies. *Global Journal of Finance and Banking Issues*, 3(3).

https://www.sundaytimes.lk/230709/business-times/non-performing-loans-reach-rs-1-6-trillion-as-at-march-31-2023-524642.html

https://www.ceicdata.com/en/indicator/sri-lanka/non-performing-loans-ratio