

The Effect of Non-performing Loan on State-owned Commercial Banks' Profitability with Operating Efficiency as Mediating Variable

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ABSTRACT

The study aims to investigate the effect of non-performing loans on profitability with operating efficiency as an intervening variable. The study is conducted on the state-owned commercial banks in Bangladesh. The purposive sampling technique is chosen to select the sample banks. Secondary data has been collected from the annual reports of sample banks. The technique of data analysis used is descriptive, multiple regression analysis, and path analysis. PROCESS Macro Mediation Model 4 has been applied to examine the mediation effect. The study finds that non-performing loan has a positive but insignificant effect on operating efficiency, on the other hand, operating efficiency has a negative and insignificant impact on profitability. The statistical result in the direct effect of non-performing loan on profitability shows that non-performing loan has a negative and significant impact on profitability in presence of the operating efficiency. The findings in PROCESS Macro mediation effect reveals that operating efficiency have no mediation effect on the relationship between non-performing loan and the profitability of state-owned commercial banks. The study recommends that bank management should take effective measures to minimize the percentage of the non-performing loan and the operating expense to operating income ratio to enhance the profitability of banks.

Keywords: Non-performing loan, Operating efficiency, Profitability, State-owned banks.

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I. INTRODUCTION

Banking institutions are an integral part of the financial sector and the lifeblood of an economy. These organizations' role is inevitable to the economic development of a country. State-owned commercial banks have a huge contribution to restructuring the economic infrastructure of Bangladesh since its independence. Being a developing country, Bangladesh heavily relies on banking industry for smooth and effective financial intermediation (Patwary & Tasneem, 2019). Banks act as intermediaries in the financial system that is to mobilize resources from the surplus unit and finance to the deficit unit. As a result, it influences the entire financial system of a country (Mendoza & Rivera, 2017). Banks form new capital in a country through resource mobilization that progresses in economic growth as well as financial stability (Singh *et al.* 2021).

Banks' financial operation i.e., collection of fund from the public and lending it to the public is performed on the basis of a sense of trust with the aim of obtaining maximum profitability (Swandewi & Purnawati, 2021). The lending decision is a very crucial issue for the banks because it is related to the income and future profitability of banks. The decision is also important because after lending funds to the people a portion of the fund remained uncollected and once it is treated as bad debt. The amount of bad debt or non-performing loans is alarmingly growing in not only in

underdeveloped or developing countries but also in developed countries (Aker & Roy, 2017). The issue of NPL is now pronounced at high tune all over the world.

Public sector banks earning growth and profit margin are sloping down because of inefficient lending decisions and increasing in non-performing loans over the years (Kumar & Selvan, 2018). This is also linked to bank management's inability to control operating efficiency which in the long run leads to a decrease in profitability (Kingu, Macha, & Gwahula, 2018). More specifically, the non-performing loans hamper interest income, narrow investment opportunities, and create liquidity crises that ultimately ruin overall financial systems and the entire economy (Singh *et al.*, 2021). Banks particularly state-owned commercial banks (SCBs) in Bangladesh are trapped in a gridlock of non-performing loans. The volume of classified loans of state-owned commercial banks is getting higher and higher over the periods. Sonali, Janata, Agrani, and Rupali bank are the state-owned commercial banks in Bangladesh. In the last decades i.e., from 2011 to 2020 the average non-performing loans of these banks were 25.53% (Author's calculation based on data). In the SCBs, the defaulted loans increased by Tk 2,703 crore to Tk 44,977 crore in December 2021, from Tk 42,274 crore a year ago. The gross non-performing loan ratio in the banking sector was 8.18% at the end of the 4th quarter 2021 whereas the gross NPL ratio of SCBs was 20.62% (NEWAGE, 2022). Thus, the NPL ratio of SCBs is more than double the industry rate.

The profitability of the banks is strongly influenced by the increase in non-performing loans. Bank has to maintain provision at a prescribed rate against classified loans. A high volume of non-performing loans and their provisioning blocks income and accelerates operating costs that reduce the profitability of the banks. That is why the present study is designed to investigate the effect of non-performing loans on state-owned commercial banks' profitability with operating efficiency as an intervening variable.

II. LITERATURE REVIEW

The study on non-performing loan, operating efficiency, and profitability of commercial banks becomes an emerging interest among researchers in developing and developed countries. The following pieces of literature relating to the subject matter under investigation have been reviewed and presented in this section.

Hasmiana and Pintor (2022) studied the effect of financial risk, capital structure, and banking liquidity on profitability with operational efficiency as mediating variables in Persero bank and private commercial banks. The study disclosed that the increase in non-performing loan interrupts and decline in lending to the public and consequently affect banks profitability. Operational efficiency measured in BOPO ratio reflects bank management capacity in terms of operational cost to income. This is significantly correlated with banks' ability to manage such risky productive assets. The study finds that financial risks, capital structure, and liquidity have a partially significant effect on operating efficiency as well as profitability. The study also reveals that financial risks, capital structure, and liquidity have no significant effect on profitability by operating efficiency as a mediator.

Nur and Emanuel (2018) analyzed the effect of credit risks measured as non-performing loan on Indonesian banks' profitability with efficiency as an intervening variable. The paper spots on the period from 2013 to 2015 decreased the profitability as measured by return on assets (ROA) due to increasing the operating expenses to operating income and huge bad loans in every year. Multiple regression and path analysis techniques are used in measuring the impact of an intervening variable. The result of the study shows that non-performing loans have a positive and significant impact on efficiency (BOPO) but an insignificant impact on profitability. The study results that non-performing loan has a significant and negative effect on profitability through operating efficiency as an intervening variable.

Islam, Akter, Alam, and Shahriar (2020) state that the existence of non-performing loans in the banking business is natural because of moral hazards and bad selection of customers in lending procedures. But the excessive volume is a curse and burden to the industry. The paper finds in the analyses that non-performing loan has a negative but statistically insignificant impact on profitability in private commercial banks in Bangladesh. Alshebmi, Adam, Mustafa, Thomran, and Fathelbab (2020) assessed non-performing loans and their effect on profitability in Saudi Arabia banking sector. The study strongly argued that the level of NPL or its higher percentage in commercial banks reflects the state of mismanagement of the commercial banking structure. That is

why it negatively influences the bank's profitability. Suyanto (2021) in another study conducted in Indonesia perspective reveals the negative association between non-performing loan and profitability. The paper remarks that a high level of bad loans is correlated with a low level of bank performance.

Noor, Das, and Banik (2018) conducted a study analyzing the impact of CRM on the financial performance of state-owned commercial banks in Bangladesh. The study focuses on the key issues of financing by the banks, how funds are provided to the business, and how efficiently manage the corporate borrowers after lending themselves. The study considered the percentage of classified loans, return on assets and return on equity to investigate the financial performance. The study reveals that in the short run the percentage of classified loan (NPL) has no significant impact on the profitability (ROA & ROE) of state-owned banks but have a significant impact in long run. Kumar and Selvan (2018) in another study conducted in India argued that public sector banks are facing turn down in earning growth and diminishing profit margin due to lower assets quality and increased sub-standard (SS) of assets. Patwary and Tasneem (2019) explored the impact of NPL on profitability of banks in Bangladesh for the study period from 1997 to 2017. The paper opines the same and added that investors and depositors lost their faith in banks and worried to get back the invested/deposited money due to increasing non-performing loans at a higher rate and showing inefficiency in credit risk management by the state-owned banks. The study also explored that NPL negatively impacts the profitability of banks in Bangladesh.

Endri (2018) mentions that the efficiency of bank operation could be demonstrated with a low level of BOPO ratio (Operating cost to operating income) reflects that banks' operation is running well with lower cost and gaining optimal income and vice versa. The statistical analysis represents that BOPO has a significant negative impact on the financial performance of bank. Ruslan, Pahlevi, Alam, and Nohong (2019) also argued that the efficiency of banks has a significant effect on banks' profitability. Banks may increase profitability by pressing inputs or lower costs. The hypothetical test of the study results that the bank's operating efficiency (BOPO) has a significant and negative effect on profitability.

Dewi and Badjra (2020) evaluated the effect of NPL, LDR, and Operating costs of operating income (BOPO) on return on income in Indonesian banks. The study identifies that BOPO is the most dominant influential factor which significantly affects bank profitability. The inferential analysis depicts that both NPL and BOPO have a negative and significant influence on return on assets or profitability. The paper recommends that the policymaker should enhance their managerial and operating efficiency if the banks get better profitability.

Hosen and Rahmawati (2016) examined the efficiency and profitability on Indonesian Islamic banking industry by applying parametric approach namely Stochastic Frontier Approach (SFA) to calculate banks' efficiency (BOPO) and using Return on Assets (ROA) ratio to calculate profitability. The study concludes that Islamic banks should operate banking operation efficiently to maximize profitability and productivity, and to maintain financial health at optimum

level. Kingu *et al.* (2018) added that increase in non-performing loan (NPL) is the outcome of adverse selection of borrowers and it is linked with banks' management's inability to control the operating efficiency that leads to a decrease in the profitability in long run. The study also recommends that bank management should require to employ cost efficiency mechanism in managing loan portfolios.

Noman, Pervin, Chowdhury, and Banna (2015) investigated the effect of credit risks on profitability of commercial banks in Bangladesh for the study period 2003 to 2013. The analytical findings show that credit risks negatively affect commercial banks profitability. The study recommends that bank management should prudentially handle the credit risks ensuring profitability and securing bank from bad loss. Akter and Roy (2017) conducted an empirical study investigating the impact of the non-performing loan on profitability of listed banks in Dhaka Stock Exchange (DSE) of Bangladesh. The empirical study results that non-performing loan statistically has significant and negative impact on net profit margin i.e., on the profitability of banks listed in DSE for the study period. In the concluding remarks, the paper highlights that the volume of bad loan or non-performing loans in banks is agonizingly increasing not only in underdeveloped and developing countries but also in developed countries. (Biswas, Nath, Biswas, & Rashid, 2021) examined the impact of the non-performing loan on the profitability of the private and public banks in Bangladesh for a period of five years from 2014 to 2018. The statistical analyses present that return on assets and non-performing loans as well as bank size have a negative relationship. The paper argued that banks failed to manage the volume and rate of NPL in banking sectors due to the proper credit risk management.

III. RESEARCH GAP

From the review of the above pieces of literature, it is found that most of the studies both in Bangladesh and outside investigate only the effect of credit risk or non-performing loans on the profitability of banks (Akter & Roy, 2017; Alshebmi *et al.*, 2020; Bandara *et al.*, 2021; Banik & Das, 2015; Biswas *et al.*, 2021; Islam *et al.*, 2020; Kingu *et al.*, 2018; Noman *et al.*, 2015; Noor *et al.*, 2018; Patwary & Tasneem, 2019; Vinh, 2017). Few other studies tried to examine only the effect operating efficiency on profitability (Endri, 2018; Hosen & Rahmawati, 2016; Kumar & Selvan, 2018; Ruslan *et al.*, 2019).

On the other hand, few pieces of work done in analyzing the effect of NPL and operating efficiency on profitability (Dewi & Badjra, 2020; Kusumastuti & Alam, 2019). Some studies found that the effect of NPL on profitability with capital adequacy ratio (CAR) as mediating variables (Adiatmayani & Panji, 2021; Simbolon & Simanjuntak, 2020; Swandewi & Purnawati, 2021).

State-owned banks/ public commercial banks in most of the countries suffer from classified loans or non-performing loans which generally occurred due to the lack of efficient banking operations or lack of operating efficiency. It significantly affects banks' profitability. A small piece of work was done overseas to investigate the effect of credit risks/ financial risks and capital structure on the profitability

of private banks with operating efficiency as mediating variables (Hasmiana & Pintor, 2022; Nur & Emanuel, 2018). No comprehensive study has yet to perform on state-owned commercial banks or public commercial banks evaluating the mediating effect on the relationship between non-performing loan and profitability. To overcome the limitation the present study is designed to investigate the effect of non-performing loan on state-owned commercial banks' profitability with operating efficiency as mediating variable.

IV. CONCEPTUAL FRAMEWORK AND HYPOTHESIS OF THE STUDY

The present study has conceptualized that non-performing loan has a significant relationship with and impact on profitability with operating efficiency as a mediator. The following research model has been developed by the researcher to examine the effect of non-performing loan on state-owned commercial banks' profitability with operating efficiency as an intervening variable.

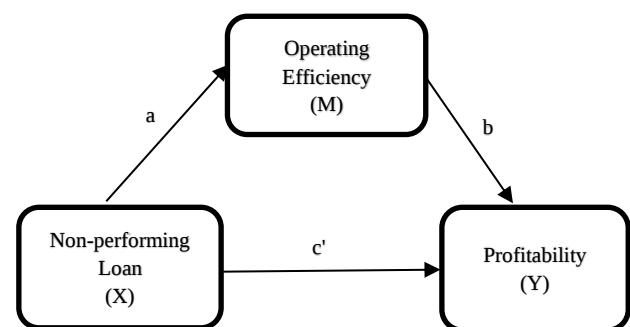


Fig. 1. Conceptual Research Model.

A. Non-performing Loan

Non-performing loans (NPL) are a portion of loans and advances of the bank in which clients are unable to settle their debt and such loan is not produce any return or income to the bank. Patwary and Tasneem (2019) state that NPL is an irregular loan from which the principal and interest amount become due for a certain period of time. NPL is one of the indicators of credit risks of banks. NPL ratio is calculated by dividing non-performing loans to total loans and advances. A higher NPL ratio means poorer credit quality and vice versa. The higher credit risks generates worse loan and charged against income (Kingu *et al.*, 2018).

Non-performing loan ratio is calculated by the given formula:

$$NPL = \frac{\text{Non-performing Loans}}{\text{Total Loans and Advances}} \times 100 \quad (1)$$

B. Operating Efficiency

Operating efficiency is measured by the performance of operating expenditure and operating income of a bank. It is represented in the BOPO ratio. BOPO is a comparison between total operating costs and total operating income. It is used to measure the level of banks' efficiency and ability to carry out their operational activities (Ngurah & Panji, 2021). BOPO requires to be given special focus by the management because it is the most dominant factor affecting banks' profitability (Dewi & Badjra, 2020). Greater the BOPO ratio

means excessive operating costs that reduce the return on assets. If BOPO level is lower, bank's management operating performance is getting better. BOPO ratio represents the following formula:

$$BOPO = \frac{\text{Total Operating Costs}}{\text{Total Operating Income}} \times 100 \quad (2)$$

C. Profitability

Profitability is the ability of a bank to generate profit from the normal business course of action for a specific period of time (Ruslan *et al.*, 2019). The profitability performance of a bank is measured by the return on assets (ROA). ROA is calculated by dividing net profit after tax to total assets of the bank at the end of the financial year. It measures how a bank is profitable relating to its assets. It shows the management's efficiency to utilize the assets in generating profits for the bank. Higher ROA proves the efficient and effective utilization of assets generating profits (Kingu *et al.*, 2018). Return on assets is calculated by using the following formula:

$$ROA = \frac{\text{Net Profit after Tax}}{\text{Total Assets}} \times 100 \quad (3)$$

D. The Effect of Non-performing Loan (NPL) on Profitability

There is a strong relationship between non-performing loan and profitability. The increases or decreases of non-performing loan generally impact on the profitability of a bank. It may either negative or positive effect on the profitability. Few studies investigated the effect of NPL on profitability of banks. Banik and Das (2015) mention that the volume of classified loan does not significantly affect the volume of profit of private and public commercial banks in Bangladesh. In a separate study, Noor *et al.* (2018) find the same result that the percentage of the classified loan is not significantly affecting profitability. Nur and Emanuel (2018) finds that non-performing loan has a positive and insignificant effect on profitability. Kusumastuti and Alam (2019) also find similar results that NPL has no significant effect on profitability.

Swandewi and Purnawati (2021) find that NPL has a negative relationship with profitability and it significantly affects profitability. Islam *et al.* (2020) disclose that NPL has negative relationship with profitability but insignificant effect on profitability of commercial banks in Bangladesh. Non-performing loans have a negative and significant impact on profitability (Akter & Roy, 2017; Bandara *et al.*, 2021; Dewi & Badjra, 2020; Kingu *et al.*, 2018; Patwary & Tasneem, 2019; Vinh, 2017; Widyakto, Suhardjo, NSS, & Ardiansari, 2021). Simbolon and Simanjuntak (2020) states that non-performing loans have negative and significant effect on return on assets of Indonesian State-owned banks. Adiatmayani and Panji (2021) also conduct a study on state-owned banks and reveal similar results. The statistical results in previous studies varied but the majority of the studies find that non-performing loan has a negative and significant effect on profitability. Thus, the following hypothesis is set for current study:

H1: Non-performing loan has a negative and significant effect on profitability.

E. The Effect of Non-performing Loan on Operating Efficiency

Non-performing loan and operating efficiency is interrelated to each other. Operating efficiency is a key parameter of measuring the financial performance of a bank. If the percentage of NPL is bigger, it hampers the operating efficiency of banks. Nur and Emanuel (2018) conduct a study and reveal that NPL has a positive and significant effect on operating efficiency. Hasmiana and Pintor (2022) studied on private and state-owned banks and find similar results through inferential analysis. So, on the basis of the result of previous studies, the following hypothesis is set for present study:

H2: Non-performing loan has a positive and significant effect on operating efficiency.

F. The Effect of Operating Efficiency on Profitability

Operating efficiency is the ratio of total operating expenditure and total operating income. Increasing or decreasing BOPO ratio significantly affects profitability of a bank. It shows the efficiency and effectiveness of management to carry out business operations with optimizing profitability. Operating efficiency has negative and significant impact on profitability (Adiatmayani & Panji, 2021; Hasmiana & Pintor, 2022; Kusumastuti & Alam, 2019; Martins, Serra, & Stevenson, 2019; Nur & Emanuel, 2018; Ruslan *et al.*, 2019). To investigate the effect of operating efficiency on profitability, the following hypothesis is set:

H3: Operating efficiency has a negative and significant effect on profitability.

G. The Effect of Non-performing Loan on Profitability with Operating Efficiency as Intervening Variables

Non-performing loan has a relationship with profitability but statistically it has a significant or insignificant impact on profitability. It is presumed that operating efficiency mediates the effect of non-performing loan on profitability of a bank. Nur and Emanuel (2018) find in analytical study that NPL has a negative and significant effect on profitability with operating efficiency as mediating variable. Hasmiana and Pintor (2022) conducted similar type of study and the result varies with previous study, the paper finds that operating efficiency could not mediate the effect of non-performing loan on profitability. That is the effect of NPL on profitability with operating efficiency as mediating variable is statistically insignificant. The following hypothesis is set for current study:

H4: Non-performing loan has a negative and significant effect on profitability with operating efficiency as mediating variable.

V. METHODOLOGY OF THE STUDY

A. Nature of the Study

The current study is analytical as it intends to examine the casual and effects relationship among dependent, independent, and mediating variables. The research approach is quantitative and empirical since it depends on secondary data and few other empirical works.

B. Sampling Techniques and Procedure

The purposive sampling technique is used to select the sample unit. Four state-owned commercial banks namely, Sonali Bank Limited, Janata Bank Limited, Agrani Bank Limited and Rupali Bank Limited, have been selected as samples for the study purposively because of carrying out the high percentage of non-performing loan and operating efficiency in the banking industry.

C. Types and Sources of Data

The study is based on secondary data which is collected from the annual reports of sample banks for ten years covering periods from 2011 to 2020. Annual reports have been extracted from the websites of the bank.

D. Variables of the Study

Variables use in the study are non-performing loan (NPL), operating efficiency, and profitability. In this study, non-performing loan (NPL) is independent variable; operating efficiency, as measured by BOPO ratio, is mediating variable; and profitability, as measured by Return on Assets (ROA), is dependent variable.

E. Technique of Analysis

The collected data is statistically analyzed by using Descriptive analysis, Multiple Regression analysis, and Path analysis. Multicollinearity tests also apply to justify whether there are multicollinearity problems among the variables. Hayes PROCESS Macro Model 4 has been used to examine the mediating effect. Data have been processed and analyzed by using SPSS 24.

VI. RESULTS

A. Descriptive Analysis

Table I represents descriptive statistics of the respective variable for 04 (four) state-owned commercial banks in Bangladesh for the data covering ten years from 2011 to 2020. The minimum, maximum, and average ROA of four banks were -1.23%, 1.03%, and 0.193%, respectively. The average ROA revealed that net profit after tax on total assets during the study period was in ups and down even negative in a few years. The average non-performing loan (NPL) was 18.79% whereas the minimum and maximum NPL were 10.16% and 25.53%, respectively. Average NPL stated that one-fifth of the total loan and advance was a non-performing loan that didn't generate income for the banks. It certainly impacts the profitability position of the banks. The average operating expenditure to operating income (BOPO) was 24.06%, and the minimum and maximum BOPO were 18.61% and 30.36% of the banks during the period. The higher BOPO also influences profitability. Finally, state-owned commercial banks couldn't maintain stable profits due to the high percentage of NPL and BOPO during the study period.

TABLE I: DESCRIPTIVE STATISTICS

Variables	N	Minimum	Maximum	Mean	Std. Dev.
ROA	10	-1.23	1.03	0.1930	0.64557
NPL	10	10.16	25.53	18.7930	4.06143
BOPO	10	18.61	30.36	24.6020	4.92061
Valid N (List wise)	10				

Source: SPSS Output (Collected data processed in SPSS).

B. Multicollinearity Analysis

Multicollinearity explains the exact linear relationship among the regression model's explanatory variables. The study tested the variance inflation factor (VIF) through the regression model to test whether the independent variables are collinear or not. If the VIF value results in more than 10 or the bearing tolerance value (1/VIF) is 0.1 or less, there might be a multicollinearity problem. The collinearity statistics are presented in table II containing VIF and Tolerance values. Accordingly, the VIF value for BOPO and NPL is the same for 1.008 and the tolerance value is 0.992 for each variable. The statistical test scores are accepted, and it implies that there is no presence of multicollinearity problem in the data.

TABLE II: MULTICOLLINEARITY TEST

Model	Variables	Collinearity Statistics	
		Tolerance	VIF
ROA	BOPO	0.992	1.008
	NPL	0.992	1.008

Source: SPSS Output (Collected data processed in SPSS).

C. Path Analysis

PROCESS Macro Model has been applied to evaluate the mediation effect of operating efficiency (M) in the relationship between non-performing loan (X) and return on assets (Y). Under this mediation model, firstly, path "a" represents the direction of X to M; secondly, path "b" represents the direction of M to Y, and finally, path c' represents X to Y in presence of M.

Table III presents the description of model and variables. PROCESS Macro Model 4 has been used and the variables underlying Y is dependent variable, X is independent variable, and M is the mediating variable.

TABLE III: DESCRIPTION OF MODEL AND VARIABLES

Model	4
Variable Explanation:	
Y	ROA
X	NPL
M	BOPO
Sample Size	10

SPSS Output.

Table IV presents the outcome of path *a* i.e., X to M variables. It represents the outcome of the effect of NPL on BOPO.

TABLE IV: OUTCOME OF PATH "A"

Model summary						
R	R-sq	MSE	F	df1	df2	P
0.0903	0.0081	27.0170	0.0657	1.000	8.000	0.8041
Model	coeff	Se	t	P	LLCI	ULCI
Constant	22.5467	8.1838	2.7550	0.0249	3.6662	41.4273
NPL	0.1094	0.4266	0.2564	0.8041	-0.8748	1.0936

Outcome variable: BOPO.

Table V shows the outcome of path *b* & *c'* that mean M to Y and X to Y. This illustrates the effect of BOPO on ROA, and the effect of NPL on ROA through the mediation of BOPO.

TABLE V: OUTCOME OF PATH "B" & C'

Model summary						
R	R-sq	MSE	F	df1	df2	P
0.7857	0.6172	0.2051	5.6443	2.0000	7.0000	0.0347
Model	Coeff	se	t	P	LLCI	ULCI
Constant	2.5632	0.9954	2.5750	0.0367	0.2080	4.9183
NPL	-0.1248	0.0373	-3.3429	0.0124	-0.2131	-0.0365
BOPO	-0.0010	0.0308	-0.0337	0.9741	-0.0739	0.0718

Outcome variable: ROA.

a) Total Effect

Total effect is comprised of paths a, b, and c' denoted by c. Based on the result, the significant p-value of the total effect is lower than 0.05 ($0.0071 < 0.05$) at 5% level of significance. The path coefficient of total effect is -0.1249 ($c = -0.1248 + 0.1094 \times -0.0010$). The Upper bound and lower bound value is in a similar sign and the difference is not zero. Thus, the total effect of NPL on ROA in presence of BOPO is statistically significant and directed a negative relationship.

b) Direct Effect

The direct effect means the effect of NPL on ROA in the presence of BOPO. The path direction is denoted by c'. The significant p-value of the direct effect is lower than 0.05 ($0.0124 < 0.05$) at 5% level of significance. The path coefficient of direct effect (path c') is -0.1248. Upper bound and lower bound value is in the same sign and the difference is not zero. So that the direct effect of NPL on ROA in presence of BOPO is statistically significant and directed a negative association.

c) Indirect Effect

Indirect effect means the effect of independent variable (X) on dependent variable (Y) through a mediating variable (M). The indirect effect is going through path a and path b. The study shows that the path coefficient of indirect effect is -0.0001 ($a \times b = 0.1094 \times -0.0010$) and the bootstrapping upper bound and lower bound values shows positive and negative sign. Thus, the indirect effect is statistically insignificant.

The total effect, direct effect, and indirect effect of X on Y are presented in Table VI.

TABLE VI: TOTAL, DIRECT, AND INDIRECT EFFECT OF X ON Y

Effect	se	T	P	LLCI	ULCI
Total Effect of X on Y:					
-0.1249	0.0348	-3.5913	0.0071	-0.2051	-0.0447
Direct effect of X on Y:					
-0.1248	0.0373	-3.3429	0.0124	-0.2131	-0.0365
Indirect effect(s) of X on Y:					
Effect	BootSE	Boot LLCI	Boot ULCI		
BOPO	-0.0001	0.0335	-0.1069	0.0239	

SPSS Output (Collected data processed in SPSS).

D. Mediation Analysis

PROCESS Macro Model 4 had used to test the mediation effect of operating efficiency (BOPO) on the relationship between non-performing loan (NPL) and profitability (ROA). The output of the PROCESS macro test (total effect, direct

effect, and indirect effect) is summarized and presented in Table VII.

VII. DISCUSSIONS

A. Effect of Non-performing Loan (NPL) on Profitability

Based on the regression model summary shown in table V, R-sq value is 0.6172 implying that state-owned commercial banks' 61.72% return on assets has been changed in presence of non-performing loan and operating efficiency. The regression coefficient value of NPL to ROA is -0.1248 and the significance p-value is .0124. The beta value implies a negative direction of NPL to ROA i.e., increasing non-performing loan by one unit decreased the return on assets of the state-owned bank by 0.1248. The significant p-value of NPL is lower than 0.05 ($0.0124 < 0.05$) stating that NPL has a significant impact on ROA. The first hypothesis (H1) indicates that the non-performing loan has a negative and significant impact on the return on assets. Hypothesis 1 is supported. This is similar to previous studies conducted by Simbolon and Simanjuntak (2020), and Adiatmayani and Panji (2021).

B. Effect of Non-performing Loan on Operating Efficiency

Based on Table IV, it is found that the coefficient beta value of NPL is 0.1094 meaning a positive relationship with BOPO. The significant p-value of NPL is .8041 with α 0.05 level of significance. It shows that the significance value of NPL is greater than α 0.05 meaning that NPL has no significant impact on operating efficiency. Hypothesis 2 is not supported. Non-performing loans of state-owned banks didn't affect operating expenditure to operating income during the study period. This study is inconsistent with previous studies done by Nur and Emanuel (2018), and Hasmiana and Pintor (2022).

C. Effect of Operating Efficiency on Profitability

Table V shows the regression coefficient of BOPO value is -.0010 displaying the negative direction to ROA. It shows that increasing one unit of BOPO decreased 0.0010 of ROA. The significant p-value of BOPO is greater than α 0.05 ($0.9741 > 0.05$) implying the impact of BOPO on ROA is statistically insignificant. The BOPO ratio is negatively associated with state-owned banks' profitability, but its effect is insignificant. The third hypothesis (H3) states that operating efficiency has a negative and significant effect on return on assets. The study reveals that operating efficiency has a negative relationship but insignificant effect on return on assets. So, hypothesis 3 is not supported. The result differs from previous studies tried by Nur and Emanuel (2018), Kusumastuti and Alam (2019), Ruslan *et al.* (2019), Martins *et al.* (2019), Adiatmayani and Panji (2021), and Hasmiana and Pintor (2022).

TABLE VII: MEDIATION ANALYSIS SUMMARY

Relationship	Total Effect	Direct Effect	Indirect Effect	Confidence Interval		t-statistics	Conclusion
				Lower Bound	Upper Bound		
NPL-> BOPO-> ROA	-0.1249 (0.0071)	-0.1248 (0.0124)	-0.0001	-0.1069	0.0239	0.003	No Mediation

Source: PROCESS Macro Model 4 Output (Processed in SPSS).

D. Meditation Analysis: Effect of Non-performing Loan on Profitability with Operating Efficiency as Mediating Variable

The study assessed the mediating role of operating efficiency on the relationship between the non-performing loan and profitability. In Table VII, the indirect effect of the impact of NPL on ROA results revealed that the t-value is lower than 1.96 ($0.003 < 1.96$) at 5% level of significance with a negative coefficient ($b = -0.0001$) and bootstrapping upper bound and lower bound value shows positive and negative sign respectively indicating the mediation effect is statistically insignificant. The fourth hypothesis implies that non-performing loan has a negative and significant effect on profitability with operating efficiency as mediating variable. The study revealed that non-performing loan has a negative but insignificant effect on profitability with operating efficiency as mediating variable. Hypothesis 4 is not supported by the result. The study is consistent with the study conducted by Hasmiana and Pintor (2022) but differs from Nur and Emanuel (2018).

The mediation effect is insignificant but the direct effect of NPL on ROA in presence of the mediator is found statistically significant ($b = -0.1248$, $p < 0.0124$). Non-performing loan negatively and significantly affects the state-owned commercial banks' profitability in the presence of operating efficiency. Thus, greater NPL ratio is alarming to the state-owned commercial banks in Bangladesh.

VIII. CONCLUSION

State-owned commercial banks are an inevitable part of the financial sector since the independence of Bangladesh and playing a significant role in the development of the national economy. The survival of the bank obviously relies on its profitability performance. It also reflects on the overall financial performances and position of banks. Whenever the volume of non-performing loans raises over the period certainly affects profitability performance. Profitability performance also depends on the operating efficiency and effectiveness of the bank. The study aims to investigate the effect of non-performing loans on the profitability performance of state-owned commercial banks with operating efficiency as an intervening variable. The empirical analysis reveals that non-performing loan has a negative and significant effect on profitability. On the other hand, the study also reveals that the effect of non-performing loans on operating efficiency is positive but statistically insignificant. Operating efficiency has also a negative and insignificant effect on profitability. PROCESS Macro mediation model test results that the mediation effect of operating efficiency on the relationship between non-performing loan and profitability of state-owned commercial banks is statistically insignificant. The study finds that operating efficiency does not intervene in the relationship between NPL and ROA. But the direct effect of non-performing loans on profitability is statistically significant and directed to a negative association. So the bank management should concentrate on minimizing the volume of non-performing loans and lowering the operational expense to operational income ratios for enhancing the profitability of the banks. The study was

confined to state-owned commercial banks only in evaluating the effect of NPL on ROA through BOPO. The study was also confined to one independent variable and one mediating variable. So, there is a further scope to conduct a study by including private commercial banks in the sample and adding more independent or mediating variables.

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