Effect of Leverage, Operating Efficiency, Non-Performing Loan, and Capital Adequacy Ratio on Profitability of Commercial Banks in Bangladesh

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ABSTRACT

The present study analyzes the influence of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on the profitability of commercial banks in Bangladesh. The study selected four state-owned commercial banks and six private commercial banks as samples purposively. The study uses secondary data collected from annual reports of sample banks. The study covers balanced panel data for a period of four years from 2017 to 2020. Panel data regression model applies to meet the research questions and hypotheses of the study. The analytical result of the study shows that the leverage as measured by the debt-equity ratio (DER) has a negative and insignificant influence on profitability (ROA). Non-performing loan (NPL) has also a negative and insignificant effect on ROA. Higher DER and NPL lower the profitability position of the bank. The study finds that the operating efficiency as measured by BOPO ratio has a positive and significant impact on ROA. The study reveals that the capital adequacy ratio (CAR) has a positive and significant effect on ROA. The present study recommends that banks should be rational about the debt financing and selection of appropriate borrowers for upholding the healthy financial position in Bangladesh.

Keywords: Capital Adequacy Ratio, Leverage, Non-performing loan, Operating efficiency, Profitability.

I. INTRODUCTION

Banks are the financial intermediaries which collect funds from the surplus units of the economy and lend to the deficit units of the economy. Banks are circulating and creating money for the economy in this way. Commercial banks are working as development assistants and strongly contributing to the growth and development of an economy all over the world. That’s why the banking sector is treated as the leading driving force of an economy (Swandewi & Purnawati, 2021). The success and failure of a bank are measured by profitability performance. By evaluating profitability performance it is merely easy to measure the efficiency and effectiveness of a bank’s resource utilization during a specific period of time (Ngurah & Panji, 2021). The strong profitability of a bank shows a higher capacity to earn profit and a bigger contribution to the economic growth of a country (Adiatmayani & Panji, 2021).

Harapha (2018) argued that capital structure/leverage, operating efficiency, non-performing loan, and capital adequacy ratio are the key parameters of banks’ performance. These indicators have a relationship with and influence on the profitability performance of a bank. Leverage is the application of the source of assets by a bank that has a fixed cost with a view to increasing the potential profit of the shareholders. Leverage and capital adequacy play a vital role in the financial decision of a bank. These two factors enhance the profitability of a bank (Shaik & Sharma, 2021). The lending decision is also important because after lending funds to the borrowers a portion of the fund remained due and uncollected and once it is treated as bad or loss. This highly influences the income generation and future profitability of a bank (Akter & Roy, 2017). The profit earning growth and margin of commercial banks are falling down due to the presence of inefficient lending decisions and increasing in non-performing loans for a period of time (Kumar & Selvan, 2018). Banks’ operational decisions relating to operational activities reflect the profitability of banks. A fruitful operational decision leads to the control of operational expenditures and increases the operating income of the bank.

Commercial banks in Bangladesh have a substantial contribution to the growth and development of an economy. Commercial banks are facing difficulties in their banking operations for increasing non-performing loans and leverage at a higher rate. A recent report published in March 2022 on NEWAGE (Online News Portal) that the defaulted loan of commercial banks in Bangladesh was increased by 17.41% from 2020 to 2021. The operating expenditure to operating income ratio (BOPO) shows the operating efficiency of banks. The BOPO ratio of commercial banks increased by 13% on average from the year 2011 to 2020 (Annual Reports). Similarly, the average leverage (debt-equity ratio) of commercial banks increased by 2.89% to 20.12% in 2020 from 17.23% in 2017 (Annual reports, 2017-2020). Commercial banks maintained the capital adequacy ratio at par (12.41% on average since 2019) as regulated by Basel III guidelines introduced by Bangladesh Bank in 2019.

The leverage (DER), operating efficiency (BOPO), non-
performing loan (NPL), and capital adequacy ratio (CAR) are the important dimensions that affect the profitability position of commercial banks in Bangladesh. Higher DER, BOPO, and NPL as well as lower CAR are the hindrances to the strong profitability of a bank. Few studies conducted previously in Bangladesh perspective on investigating the impact of credit risks or non-performing loans on the profitability of banks (Bhanik & Das, 2015; Biswas, Nath, Biswas, & Rashid, 2021; Noman, Pervin, Chowdhury, & Banna, 2015; Noor, Das, & Banik, 2018) but not focused comprehensively on evaluating the effect of DER, BOPO, NPL, and CAR on the profitability of commercial banks in Bangladesh. So, the study aims to investigate the effect of leverage (DER), operating efficiency (BOPO), non-performing loan (NPL), and capital adequacy ratio (CAR) on the profitability (ROA) of commercial banks in Bangladesh. The remaining part of the study has been organized as follows: Literature review and hypothesis development in section II, Research methodology and proposed model in section III, Empirical results in section IV, Discussion of the empirical results in section V, and the conclusion is presented in the final section.

II. LITERATURE REVIEW AND HYPOTHESIS OF THE STUDY

A. Profitability

Profitability is the ability of a commercial bank to generate profit from the regular business operation for a certain period of time (Ruslan, Pahlevi, Alam, & Nohong, 2019). The profitability performance is measured by the return on assets (ROA) of the bank. It indicates how the bank is profitable in relation to the available assets. Profitability also shows the level of efficiency and effectiveness of bank management in generating profit. The greater ROA implies the bank is gaining more profits and a higher contribution to the economy of a country Adiatmayani and Panji (2021).

B. Leverage

Leverage illustrates the amount of funds contributed by the borrower and the shareholder of the company. Leverage is measured by the debt-equity ratio (Harisa, Mohamad, & Meutia, 2019). It is used to measure the ability of a bank to pay all of its obligations by the shareholders’ fund (Ngurah & Panji, 2021). The bank’s profitability will be lower if the DER is higher.

C. Effect of Leverage on Profitability

If the debt-equity ratio is higher, then the bank’s ability to obtain profitability will relatively be lower. So, DER has a negative relationship with profitability. Harahap (2018) finds in her study that DER has a negative relationship but insignificant effect on profitability. The result is similar to the works done by Harisa et al. (2019) & Lestari, Tarigamb, and Pohanc (2021). Kartikasari and Merianti (2016) studied the effect of leverage on profitability and disclose that the debt-equity ratio has a positive and significant effect on profitability. Shahcheria and Valizadeh (2018) finds the same result in her analysis that there is a positive and significant relationship between leverage and profitability. On the other hand, Bintara (2020) differs from previous studies and finds that leverage has a negative and significant effect on profitability. The result is consistent with the study conducted by Bunyaminu, Yakubu, and Bashiru (2021). The study shows that leverage has a negative and significant impact on profitability with 1% significance level.

D. Operating Efficiency

Operating efficiency is measured by the BOPO. BOPO is the ratio between total operating costs and total operating income of a bank (Endri, 2018). BOPO measures the level of a bank’s ability to carry out its business activities (Ngurah & Panji, 2021). Bank management should employ special focus on BOPO because it is the most dominant factor affecting banks’ profitability (Dewi & Badjra, 2020). If the BOPO level is lower, then bank management operating performance is better and the profitability is upper.

E. Effect of Operating Efficiency on Profitability

BOPO ratio reflect to the total operating costs to the total operating income. Any increase in operating expenses definitely decrease the profit for a bank, so there is a causal effect and negative relationship between operating efficiency and profitability. Nur and Emanuel (2018) has done a work and finds that BOPO has a negative and significant effect on profitability. The result is similar to the studies performed by (Adiatmayani & Panji, 2021; Hasmiana & Pintor, 2022; Kusumastuti & Alam, 2019; Martins, Serra, & Stevenson, 2019; Pradnyawati & Widhiastuti, 2020; Ruslan et al., 2019).

F. Non-performing Loan

Non-performing loan (NPL) is a type classified loan that generating no income for the bank. According to level of risks, classified loans are four categories viz., Special Mention Account (SMA), Sub-standard (SS), Doubtful, and Bad/Loss. Non-performing loan comprises of sub-standard, doubtful, and bad/loss (BangladeshBank, 2021). Non-performing loan is an irregular loan in which principal and interest amount remain due to the customers for a specific period of time (Patwary and Tasneem (2019). Bank’s credit risks are generally measured by NPL. The higher NPL ratio shows that the bank’s credit quality is too low and it is charged against income (Kingu, Macha, & Gwahula, 2018).

G. Effect of Non-performing Loan on Profitability

Bad loan causes both increasing costs and decreasing operating assets of the banks that affecting profitability position. This means that non-performing loans direct the negative flows in relation to profitability. Islam, Akter, Alam, and Shahriar (2020) investigate the effect of non-performing loan on profitability and finds the negative and insignificant effect of NPL on the profitability of commercial banks in Bangladesh. Patwary and Tasneem (2019) perform an analytical study on commercial banks evaluating the effect of NPL on profitability. The study results that NPL has a negative relationship and significant influence on profitability. The result is consistent with a few other studies done by Bandara, Jameel, and Haleem (2021), Dewi and Badjra (2020), Swandewi and Purnawati (2021), Widiyakto, Suhardjo, NSS, and Ardiansari (2021). Studies were done by Simbolon and Simanjuntak (2020), Adiatmayani and Panji (2021) on state-owned commercial banks and reveals the same results.
H. Capital Adequacy Ratio

Capital Adequacy Ratio (CAR) is the ratio of the bank’s capital ability presenting how far its assets have risks. The capital also originates risk itself if the bank collects capital from the sources outside the bank. The bank’s sufficient capital expands business size and improves profitability (Kusumastuti & Alam, 2019). If the value of CAR is high, the bank enables to finance in operational activities and make an extensive contribution to profitability (Harahap, 2018). Capital adequacy ratio is a comparison between the amount of core capital (Tier-1) and supplementary capital (Tier-2) with risk weighted assets (RWA). As per Basel III guidelines and regulation introduced by Bangladesh Bank, banks require to maintain minimum capital requirement at 10% and also to maintain 2.5% additional Capital Conservation Buffer (CCB) in the form of Common Equity Tier-1(CET1) against their risks-weighted assets (BangladeshBank, 2021).

I. Effect of Capital Adequacy Ratio on Profitability

There is a positive relationship between capital adequacy ratio and profitability. The higher value in CAR increased the financing activities of the bank and produce greater profitability. So there is a significant impact of CAR on profitability. Swandewi and Purnawati (2021) in an empirical study find the positive and significant effect of CAR on profitability. Other empirical studies also find the similarities conducted by Simbolon and Simanjuntak (2020), Adiatmayani and Panji (2021), Ngurah and Panji (2021). But Kusumastuti and Alam (2019) find that CAR has a positive but insignificant effect on profitability.

J. Research Questions

The present study raises the following specific research questions:

i. Have leverage, operating efficiency, and non-performing loans any negative and significant effect on profitability of commercial banks in Bangladesh?
ii. Has capital adequacy ratio any positive and significant effect on profitability of commercial banks in Bangladesh?

K. Research Hypothesis

Based on the review of related literatures and research questions, the following hypotheses have undertaken for the present study:

H1: Leverage has a negative and significant effect on profitability.
H2: Operating efficiency has a negative and significant effect on profitability.
H3: Non-performing loan has a negative and significant effect on profitability.
H4: Capital Adequacy Ratio has a positive and significant effect on profitability.

III. RESEARCH METHODOLOGY AND MODEL

The study approach is empirical and quantitative as it relies on secondary data as well as some other empirical works. The present study conducts to analyze the impact of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on profitability of some selected private and public sector commercial banks, thus it is an analytical work. The population in the study is all the private and public sectors’ commercial banks in Bangladesh. There are 06 (six) state-owned commercial banks (SOCBs) and 43 (forty-three) private commercial banks (PCBs) in Bangladesh (Website, BB). Among them, 10 commercial banks (04 SOCBs and 06 PCBs) have been selected as samples on a convenient basis. Four state-owned commercial banks are Agrani Bank Ltd., Janata Bank Ltd., Rupali Bank Ltd., and Sonali Bank Ltd.; and six private commercial banks include BRAC Bank Ltd., Dutch-Bangla Bank Ltd., Islami Bank Bangladesh Ltd., National Bank Ltd., Pubali Bank Ltd., and Southeast Bank Ltd. The study is based on secondary data that has been collected from the audited annual reports of sample banks’ websites. The study period covers four years from 2017 to 2020.

The variable used in the study is independent and dependent variable. The independent variables are Leverage (DER), Operating Efficiency (BOPO), Non-performing Loan (NPL), and Capital Adequacy Ratio (CAR). The dependent variable is profitability (ROA). The study uses four independent variables as factors that affect commercial bank’s profitability. Leverage as measured by Debt-Equity Ratio (DER), operating efficiency as measured by BOPO ratio, non-performing loan (NPL), capital adequacy ratio (CAR), and profitability as measured by Return on Assets (ROA) are calculated by using the following formulas:

\[ ROA = \frac{Net \ Profit \ after \ Tax}{Total \ Assets} \times 100 \]  
\[ DER = \frac{Bank \ Debt}{Total \ Equity} \]  
\[ BOPO = \frac{Total \ Operating \ Costs}{Total \ Operating \ Income} \times 100 \]  
\[ NPL = \frac{Non-performing \ Loans}{Total \ Loans \ and \ Advances} \times 100 \]  
\[ CAR = \frac{Bank's \ Capital}{Total \ Risks \ Weighted \ Assets} \times 100 \]

The study employs descriptive analysis, correlation analysis, and panel data regression analysis. The descriptive analysis applies to find out the mean, minimum, maximum, and standard deviation of the variables. Panel data regression analysis uses to analyze the impact of independent variables on the dependent variable. Panel data is the combination of cross-sectional and time series data. Data used in the study is balanced panel data.

Panel data analysis comprises of three basic regression approaches namely, Pooled Ordinary Least Square (POLS), Random Effect Model (REM), and Fixed Effect Model (FEM). In selecting the appropriate specific model, Breusch Pagan (BP) test and Hausman Test have been applied in the study. Breusch Pagan (BP) test is performed to choose the pooled least square model or random effect model. The BP test’s null hypothesis is that pooled least square model is appropriate than random effect model. The Hausman test’s null hypothesis is that random effect model is appropriate than fixed effect model. Data have been coded, tabulated, and
analyzed by using STATA 15. Pooled least square model, fixed effect model, and random effect model are presented using regression equation 6, 7, & 8:

\[ \text{ROA}_i = \alpha + \beta_1 \text{DER}_i + \beta_2 \text{BOPO}_i + \beta_3 \text{NPL} + \beta_4 \text{CAR}_i + u_{it} \]  
(6)

\[ \text{ROA}_i = \alpha + \beta_1 \text{DER}_i + \beta_2 \text{BOPO}_i + \beta_3 \text{NPL} + \beta_4 \text{CAR}_i + u_{it} \]  
(7)

\[ \text{ROA}_i = \alpha + \beta_1 \text{DER}_i + \beta_2 \text{BOPO}_i + \beta_3 \text{NPL} + \beta_4 \text{CAR}_i + u_{it} \]  
(8)

where, i and t indicate entities and time respectively, ROA refers to profitability, \( \alpha \) is constants or intercept, \( \text{DER} \), BOPO, NPL, and CAR respectively, \( u_{it} \) is the error term assumed to be normally and independently distributed with zero mean; \( u_{it} \) is errors within entities.

A. Research Model

Based on the literature review the following research model has been developed by the researcher for the present study. The research model has been developed to examine the influences of leverage, operating efficiency, non-performing loan, and capital adequacy ratio on the profitability of commercial banks in Bangladesh.

IV. RESULTS

A. Descriptive Analysis

The descriptive statistics of dependent and independent variables are presented in Table I covering four years data from 2017 to 2020 with 40 observations. The minimum, maximum, and average profitability of 10 commercial banks are showing 0.01%, 2.02%, and 6.21% respectively. The average return on assets of sample banks are below 1% that indicates the flow of profitability during the study period was not consistent. The average ROA looks pretty good due to the higher average ROA of private commercial banks (0.922) as compare to state-owned commercial banks (0.169). The average DER shows foreign capital (external debt) to equity capital of commercial banks are 18.44 times, whereas the minimum and maximum 6.91 and 50.1 times. The average DER of private and state-owned commercial banks are almost same (17.46 & 19.91). The average, minimum, and maximum operating efficiency (BOPO) ratio are 33.09%, 24.14%, and 54.87% respectively. The BOPO ratio in state-owned commercial banks (28.77%) is lower than the private commercial banks (35.96%) that implies state-owned commercial banks maintain good BOPO ratio during the study period. Non-performing loan (NPL) ratio represents that the average NPL is 10.73%, whereas minimum and maximum NPL are 2.2% & 35.28% respectively. Though the average NPL is 10.73% but the average NPL of state-owned commercial banks (18.98%) is much higher than private commercial banks (5.23%). The minimum, maximum, and average capital adequacy ratio are 6.53%, 17.2%, and 11.99%. The average CAR (11.99%) shows that the sample banks have maintained the regulatory requirement of capital to risks weighted assets (10%) as per Basel III accord. The average CAR maintained by private commercial banks (13.22%) is slightly higher than the state-owned commercial banks (10.01%) during the study period.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
<th>Mean SOCBs</th>
<th>Mean PCBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>40</td>
<td>0.621</td>
<td>0.55</td>
<td>0.01</td>
<td>2.02</td>
<td>0.169</td>
<td>0.922</td>
</tr>
<tr>
<td>DER</td>
<td>40</td>
<td>18.439</td>
<td>10.408</td>
<td>6.91</td>
<td>50.1</td>
<td>19.91</td>
<td>17.46</td>
</tr>
<tr>
<td>BOPO</td>
<td>40</td>
<td>33.085</td>
<td>7.985</td>
<td>24.14</td>
<td>54.87</td>
<td>28.77</td>
<td>35.96</td>
</tr>
<tr>
<td>NPL</td>
<td>40</td>
<td>10.729</td>
<td>8.789</td>
<td>2.2</td>
<td>35.28</td>
<td>18.98</td>
<td>5.23</td>
</tr>
<tr>
<td>CAR</td>
<td>40</td>
<td>11.987</td>
<td>2.269</td>
<td>6.53</td>
<td>17.2</td>
<td>10.01</td>
<td>13.22</td>
</tr>
</tbody>
</table>

Sources: STATA Output (Data Processed in STATA).

B. Normality Test (Jarque-Bera Test)

Based on the normality test using Jarque Bera test presented in Table II shows that Jarque Bera chi-square value is 2.31 and the corresponding p-value is 0.315. JB calculated value is less than the critical value (2.31<5.991) at 5% level of significance for 2 d.f., and the calculated p-value is greater than the significance value \( \alpha 0.05 \) (0.315>0.05). It means that Ho is accepted which indicates that the data used in the current study are normally distributed. So, the model meets the normality assumption.

<table>
<thead>
<tr>
<th>JB Test</th>
<th>Value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skewness</td>
<td>0.15079</td>
<td></td>
</tr>
<tr>
<td>Excess Kurtosis</td>
<td>-1.13799</td>
<td></td>
</tr>
<tr>
<td>Observation</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Jarque-Bera (Chi-square 2 df)</td>
<td>2.31</td>
<td></td>
</tr>
<tr>
<td>p-value</td>
<td>0.315</td>
<td></td>
</tr>
</tbody>
</table>

C. Multicollinearity Analysis

The collinearity statistics shown in table III indicates that the tolerance value of DER, BOPO, NPL, and CAR is higher than 0.10 and also the variable inflation factor (VIF) value of such variables is lower than 10. Thus, in the regression model, there is no presence of a multicollinearity problem.
TABLE III: TESTING OF MULTICOLLINEARITY

<table>
<thead>
<tr>
<th>Models</th>
<th>Variables</th>
<th>VIF</th>
<th>1/VIF (Tolerance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>DER</td>
<td>1.28</td>
<td>0.78007</td>
</tr>
<tr>
<td></td>
<td>BOPO</td>
<td>1.85</td>
<td>0.540933</td>
</tr>
<tr>
<td></td>
<td>NPL</td>
<td>1.53</td>
<td>0.653840</td>
</tr>
<tr>
<td></td>
<td>CAR</td>
<td>2.02</td>
<td>0.494085</td>
</tr>
</tbody>
</table>

Source: STATA Output.

D. Heteroscedasticity Test (White Test)

White test is used in this study for heteroscedasticity testing. H0: There is no heteroscedasticity problem in the model; H1: There is a heteroscedasticity problem in the model. White test result in Table IV shows that the significance value x ^ 2 (Chi-square 2) is greater than α 0.05 (0.3722>0.05). So, H0 is accepted which means there is no heteroscedasticity problem in the model. All the variables in the regression model are free from the symptoms of heteroscedasticity.

TABLE IV: WHITE TEST

<table>
<thead>
<tr>
<th>Source</th>
<th>chi2</th>
<th>df</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heteroscedasticity</td>
<td>15.09</td>
<td>14</td>
<td>0.372</td>
</tr>
<tr>
<td>Skewness</td>
<td>7.22</td>
<td>4</td>
<td>0.1246</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.61</td>
<td>1</td>
<td>0.2048</td>
</tr>
<tr>
<td>Total</td>
<td>23.92</td>
<td>19</td>
<td>0.1994</td>
</tr>
</tbody>
</table>

Source: STATA Output.

E. Panel Data Regression Analysis

Selection of appropriate panel data regression model: Table V shows the outcome of selection of appropriate panel data regression models. Breusch and Pagan (BP) test has been applied to select between pooled ordinary least square and random effect model. The BP test results that the calculated p-value is lower than significance level α 0.05 (0.0074<0.05) implies that null hypothesis is rejected. Thus, random effect model is appropriate. Further, Hausman Test is required to select between random effect model and fixed effect model. Hausman test statistics represents that the calculated p-value is higher than significance level α 0.05 (0.035>0.05). That means, null hypothesis is accepted. Random effect model is appropriate than fixed effect model.

TABLE V: CONCLUSIONS FOR TESTING PANEL DATA REGRESSION MODELS

<table>
<thead>
<tr>
<th>No.</th>
<th>Method</th>
<th>Testing</th>
<th>P-value</th>
<th>H0 Rejected/ Accepted</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Breusch and Pagan (BP)</td>
<td>Pooled Ordinary</td>
<td>0.0074</td>
<td>H0 rejected (0.0074&lt;0.05)</td>
<td>Random Effect</td>
</tr>
<tr>
<td></td>
<td>Lagrangian Multiplier</td>
<td>Least Square (POLS)</td>
<td>0.0074</td>
<td>H0 rejected (0.0074&lt;0.05)</td>
<td>Random Effect</td>
</tr>
<tr>
<td></td>
<td>Test</td>
<td>Random</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Hausman Test</td>
<td>Fixed Effect Vs. Random Effect</td>
<td>0.0529</td>
<td>H0 accepted (0.0529&gt;0.05)</td>
<td>Random Effect</td>
</tr>
</tbody>
</table>

F. Random Effect Model

Based on result shown in Table VI, Chi-square value is 10.226 with p-value 0.037 indicates that the panel data regression model in fixed effect approach is statistically significant (0.037<0.05). The overall r-squared (R^2) value for the model is 0.602, reveals that the overall explanatory power of the regression model appeared strong (>0.5). It indicates that 60.20% of the variation in commercial banks profitability measured by ROA was explained by the variation in the DER, BOPO, NPL, and CAR. So that there are 39.80% (100%-60.20%) of the value of the dependent variable is influenced by other factors outside the independent variable in the study.

TABLE VI: REGRESSION RESULTS OF RANDOM EFFECT MODEL

<table>
<thead>
<tr>
<th>No.</th>
<th>Method</th>
<th>ROA Coef.</th>
<th>Std.Err</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Constant</td>
<td>-0.583</td>
<td>0.57</td>
<td>-1.02</td>
<td>0.307</td>
</tr>
<tr>
<td></td>
<td>DER</td>
<td>-0.014</td>
<td>0.01</td>
<td>-1.38</td>
<td>0.169</td>
</tr>
<tr>
<td></td>
<td>BOPO</td>
<td>0.02</td>
<td>0.013</td>
<td>1.54</td>
<td>0.142</td>
</tr>
<tr>
<td></td>
<td>NPL</td>
<td>-0.004</td>
<td>0.01</td>
<td>-0.41</td>
<td>0.682</td>
</tr>
<tr>
<td></td>
<td>CAR</td>
<td>0.071</td>
<td>0.035</td>
<td>2.03</td>
<td>0.048</td>
</tr>
</tbody>
</table>

Panel variable: Bank (strongly balanced), No. of Group: 10

V. DISCUSSIONS

As explained in Table V, Breusch-Pagan (BP) test rejects pooled ordinary least square method and accept random effect model. Furthermore, Hausman test rejects fixed effect model and accept random effect model. As a result, random effect model’s regression results presented in Table VI for the discussion on the effect of DER, BOPO, NPL, and CAR on ROA.

A. Effect of Leverage on Profitability

Based on the table VI, the coefficient value of DER is -0.124 indicating the negative relationship between DER and ROA. It shows that a one-unit rise in DER decreases ROA by -0.124 units. The p-value of DER is higher than the significance level α 0.05 (0.682>0.05) implying that DER has no significant effect of ROA. The first hypothesis (H1) indicates that leverage has a negative and significant effect on profitability. Hypothesis 1 is not supported. The findings is consistent with works done by Haraph (2018) and Lestari et al. (2021).

B. Effect of Operating Efficiency on Profitability

The result in coefficient value of BOPO is .02 reporting that operating efficiency has a positive relationship with profitability. The corresponding p-value of BOPO is greater than significance level α 0.05 (0.682>0.05) indicating that the effect of BOPO on ROA is insignificant. Thus the results shows that BOPO has a positive and insignificant impact on profitability of commercial banks in Bangladesh. The second hypothesis (H2) represents that operating efficiency has a positive and significant effect on profitability. The hypothesis 2 is not supported. The findings in the study is not in line with Nur and Emanuel (2018), Ruslan et al. (2019), Kusumastuti and Alam (2019), Martins et al. (2019), Pradnyawati and Widhiastuti (2020), Adiatmayani and Panji (2021), and Hasmiana and Pintor (2022).

C. Effect of Non-performing Loan on Profitability

The coefficient value of NPL is -0.004, and the calculated p-value is higher than significance level α 0.05 (0.682>0.05). It implies that the NPL has a negative and insignificant impact on profitability. The coefficient value (-.004) indicates that a
one-unit increase in NPL decrease ROA by 0.004 units. So, there is a negative relationship between NPL and ROA. The third hypothesis (H₃) presents that NPL has a negative and significant effect on profitability. Hypothesis 3 is not supported. The study reveals that NPL has a negative relationship but no significant impact on profitability of commercial banks in Bangladesh. The findings matches to Islam et al. (2020) but differ with Patwary and Tasneem (2019), Dewi and Badjira (2020), Bandara et al. (2021), Swandewi and Purnawati (2021), Widyakto et al. (2021), Simbolon and Simanjuntak (2020), Adiatmayani and Panji (2021).

D. Effect of Capital Adequacy Ratio on Profitability

Based on the output in Table VI, the coefficient value of CAR is .071 signifying that CAR has a positive relationship with ROA. The significance p-value is lower than significance level α = 0.05 (0.048<0.05) showing that the effect of CAR on ROA is statistically significant. The statistical output presents that CAR has a positive and significant impact on ROA. The fourth hypothesis (H₄) states that CAR has a positive and significant impact on ROA. The hypothesis 4 is supported by the result. This is statistically prove that the higher capital adequacy ratio significantly improves the profitability of commercial banks in Bangladesh. The findings is consistent with the output reported by Swandewi and Purnawati (2021), Simbolon and Simanjuntak (2020), Adiatmayani and Panji (2021), Ngrah and Panji (2021).

VI. CONCLUSION

Commercial banks are working as development partners and significantly contributing to the growth and development of the economy of Bangladesh. The success and survival of banks rely more on a sound profitability position. The DER, BOPO, NPL, and CAR are the important dimensions that affect the profitability position of banks. Higher DER, BOPO, and NPL as well as lower CAR are the hindrance to the strong profitability of a bank. So, the study aims to investigate the effect of DER, BOPO, NPL, and CAR on the profitability (ROA) of commercial banks in Bangladesh. Random effect model in panel data regression has been applied to examine the effect of such dimension on profitability. The result of the empirical study reveals that DER and NPL have a negative relationship and insignificant impact on the profitability of commercial banks in Bangladesh. The rise in DER and NPL reduces the profitability of the banks. Banks should give special focus on debt financing, though it generates profit to some extent but might be risky in any recession of the economy. A higher rate of NPL limits income generation and adversely affects the asset quality of banks. Banks should be more careful at the time of selecting borrowers. The study also reveals that BOPO has a positive relationship and insignificant effect on profitability. Banks’ operation management should be efficient and effective in making fruitful decisions in operating activities because it directly influences profitability. The study finds that CAR has a positive and significant influence on profitability of commercial banks in Bangladesh. The higher CAR value significantly improves the profitability and shows the strong financial conditions of banks. There are few shortcomings of the present study. Firstly, the study covers four years only from 2017 to 2020. Secondly, the study considered DER, BOPO, NPL, and CAR as independent variables to investigate the effect on profitability. The R² statistics highlights that 60.20% of changes in ROA by these factors but remaining percentage changes by other factors. So, there is a scope of conducting further study on this topic by extending study period and adding more dimensions to test the impact on profitability of commercial banks in Bangladesh.

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