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Research paper

Factors influencing the Bank's performance: Comparative study between fourth generation and top banks of Bangladesh

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Abstract

Purpose: To explore the influence of bank-specific accounting variables on the profitability of commercial banks and to investigate some significant differences in Bangladesh's fourth generation banks and top banks during the period 2013-2018.

Methodology: This study used an Ordinary least square (OLS) regression model. Return on asset (ROA) and Return on equity (ROE) were regressed interchangeably with the independent variables: Non-performing loan (NPL), cost to income ratio, loan to deposit ratio, cost of fund, capital adequacy ratio, debt to equity ratio, and market size. For this purpose, regression variables for the year 2013-2018 were collected from the financial statements of the sample banks, Bangladesh Bank website, Dhaka stock exchange website, and Lanka Bangla Financial portal.

Findings: The result indicates that, among the explanatory variables considered, the cost of fund has a significant positive relationship and cost to income, debt to equity ratio have a significant negative association with the fourth generation bank's ROA. ROA of top banks also shows a significant positive relationship with the cost of fund and a negative relationship with only the debt to equity ratio. On the other hand, the ROE of the fourth generation banks is positively impacted by loan to deposit ratio and negatively by cost to income ratio. Conversely, ROE of top banks has a significant positive relationship with the cost of fund and a significant negative relationship with NPL and cost of fund at a 5% significance level.

Originality: The results of this study provide policymakers and regulators with valuable guidance on the effect of fundamental accounting variables on the profitability of a bank. It will be helpful for further policymaking and regulations.

Keywords: Bank's profitability, Loans, Size, Capital, Cost

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1. Introduction

The involvement of bank performance in the recent world financial crisis of 2007-2009 in national and international economics need to be continuously monitored (Olweny & Shipho, 2011). A quality financial output of banks is the key to benefit their shareholders as well as the entire economy. It helps the bank to hold its position successfully and to boost a country's economic development, especially where financial markets have not been well established in countries such as Bangladesh (Kalpana & Rao, 2007). The total number of scheduled banks in Bangladesh has now reached 59, including 6 state-owned banks, 3 specialized banks, 8 full-fledged Islamic banks, 33 conventional private commercial banks and 9 foreign banks (Bangladesh Bank, 2018). Among all of these banks, nine banks are considered as fourth-generation banks that have been allowed to start their operations between 2013-2016.

Though Bangladesh's financial sector is mainly controlled by its banking sector, the success of this sector has not been satisfactory in the recent past. Relevant stakeholders frequently raised concerns about the gradual decline of banking efficiency. The inclusion of more banks in the banking sector will not go without scrutiny with all these inconveniences. Banks are focused on the assessment of borrowers' credit value and provide ongoing oversight to ensure that lenders fulfill their obligations (Bollard, Hunt & Hodgetts, 2011). Satisfactory bank output is vital to economic development that makes the saving-investment cycle smoother, more effective, and easier to reach (Haile, Getacher, & Tesfay, 2015). On the other hand, if any bank fails, then it affects investors, depositors, other banks as well as all other business respectively

With the burning concern of deteriorating health of the new fourth generation banks in Bangladesh, a better investigation from both scholars and industry specialists is essential. Therefore, the purpose of this paper is to reduce the literature gap by providing empirical support to evaluate the profitability of top banks and the fourth-generation banks of Bangladesh. The paper also compares the relative importance of each element affecting bank output in these two bank sets. This study will enlighten the regulators with valuable direction on the effect of such fundamental variables, which will be helpful for further decision making. The remainder of this paper is sequenced as follows: the second section includes the formulation of theories and pertinent analysis of literature. The third section includes data collection methods, calculation of variables, and the study's statistical model. The fourth part comprises discussions and results analysis. Finally, conclusions, suggestions, and recommendations are presented for further research.

2. Literature review

The performance of the banking sector is a subject that has received a lot of attention in recent years. A post-crisis (2011-2017) comparison of the banking industry in the USA and Asian developed economies in terms of the effect of bank capital, liquidity level, and credit risk were evaluated by Abbas et al. (2019). The study showed that liquidity is more intensive compared to capital when it comes to influencing profitability. But coefficient signs were similar irrespective of the size of the bank. According to the results, liquidity and capital appeared to have a positive impact, whereas credit risk posed a negative impact on the banks' profitability. For investigating the determinants of bank profitability in Vietnam, Batten, and VinhVo (2019) employed a number of econometric models with a unique panel dataset covering the period from 2006 to 2014. Though across profitability measures, the direction of causality was not uniform, bank

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size, risk, expense, productivity, and capital adequacy appeared to have strong impacts on profitability.

Using a set of independent variables of bank specific factors, Al-Homaidi et al. (2018) tried to find the determinants of the profitability of Indian commercial banks. The bank-specific factors included bank size, capital adequacy, deposits, leverage, assets quality, liquidity, leverage, number of branches, and assets management. A 10 years panel data of more than 60 Indian commercial banks was used where the Generalized Method of Moments (GMM), pooled, fixed and random effects models were employed. Bank size, number of branches, assets management ratio, and leverage ratio showed highly significant results in determining profitability.

Ariyadasa et al. (2017) used data of 10 major Sri Lankan Licensed Commercial Banks (LCBs) from 2006-2014 in an error correction model to investigate the factors that affect profitability. According to the result, capital and liquidity have a positive effect, and interest margin, default loans, interest rates, and operating cost have a negative effect on bank profitability in the short run. On the other hand, Ozili (2017) used static and dynamic panel estimation techniques to examine the determinants of profitability for African banks. Bank size, loan loss provisions, and total regulatory capital appeared to be the significant determinants for listed banks' return on assets compared to the non-listed ones.

Bikker and Vervliet (2017) investigate how low interest rate impacts the profitability and risk-taking attributes of US banking sector. They use both static and dynamic approaches and find that low interest rate has a negative impact on overall bank performance and net interest margins. On the other hand, Rekik et al. (2017) try to identify the determinants of bank efficiency and profitability of conventional banks. By comparing two types of profitability measures (accounting-based and economic based) of 14 countries, they find that the cost and profit efficiency of the conventional banks can be explained by the accounting variables, however, cost efficiency has minimal impact on the overall profitability of a bank. This paper uses data from over 110 banks of 14 different countries for the period 1999-2012 and they argue that instead of cost efficiency, researchers should emphasize more on profit efficiency.

Bitar et al. (2017) also study the impact of imposing higher capital ratios on efficiency and profitability of banks. By analysis data from 1992 banks across 39 OECD countries for a span of 15 years (1999-2013). They find that higher capital ratio requirements impact negatively on the efficiency and profitability of banks that have higher liquidity. Their finding is robust as the finding holds for subsample, different measures for risk, profitability and efficiency and various estimation methods.

Sun et al. (2017) analyze the key variables from documents on bank intermediation margins of two categories of bank of the OIC countries. For conventional banks they used net interest margin whereas for Islamic banks they used net profit margin as the dependent variables. Dynamic GMM (generalized method of moments) was applied to data of 105 countries over a span of 14 years to overcome the issue of endogeneity. Surprisinly, they found that the difference between the margins of two categories of bank is significant, 2.17% and 1.61% respectively. They argue that, management quality, capital adequacy and diversification determinants have good explanatory power in explaining the margins of the banks.

Hamdia and Hakimbi (2016) aim to study the impact of liquidity on overall bank profitability by defining the optimal liquidity level. By using data from 127 countries

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over a span of 10 years (2005-2015), they run PSTR (Panel Smooth Transition regression). Their finding suggests that the level of profitability decreases with increasing credit risk.

To examine the performance of 77 South-Asian banks, Sufian (2012) included commercial banks from Bangladesh, Sri Lanka, and Pakistan between 1997 and 2008. Bank performance was found to be positively impacted by non-interest income, capitalization, credit risk, and liquidity negatively impacted by cost. On the other hand, Akhtar et al. (2011) reported the significance of size and networking capital while studying the risk management practices of Islamic banks.

Hussein A. Tamimi (2010) studied the differences in the factors that affect Islamic and conventional banks' performance in the UAE during the period 1996-2008. The dependent variables in the regression model were ROE and ROA. The independent variables were GDP per capita, financial development indicator (FIR), size, concentration, liquidity, cost, and the number of branches. For conventional banks, the most significant determinants were liquidity and concentration, whereas for Islamic banks were cost and number of branches.

The performance of 37 Bangladeshi commercial banks between 1997 and 2004 was examined by Sufian and Habibullah (2009a). They found that loan intensity, credit risk, and cost have positive and significant impacts on bank performance, while non-interest income poses a negative impact over bank profitability. The results also concluded that the effect of size is not uniform across various employed measures but has a negative impact on return on average equity (ROAE) and the opposite on net interest margins (NIM) and return on average assets (ROAA). During the post-reform period of 2000–2005, Sufian and Habibullah (2009b) examined four State Owned Commercial Banks (SOCBs) and the 12 Joint Stock Commercial Banks (JSCBs) in China. The empirical findings showed that profitability is positively related to credit risk, size, and capitalization, whereas negatively related to overhead costs, liquidity, and network embeddedness.

For the period of 2000 to 2004, Malaysian non-commercial banks financial institutes (NCBFIs) were studied by Sufian and Parman (2009) to find whether macroeconomic and bank-specific factors influence profitability or not. Ordinary least square model showed that high credit risk and loan intensity results in lesser profitability level and high operational expenses, and the level of capitalization results in higher profitability.

Ben Naceur and Goaied (2008) examined the Tunisian banks to see how net-interest margin and profitability were impacted by the financial structure, bank characteristics, and macroeconomic conditions from 1980 to 2000. The study found that higher net interest margin and profitability levels to be relatively high when the amount of capital and higher overhead expenses is high too. However, size was found to be negatively related to profitability.

Bashir (2003) tried to identify the Islamic banks' determinants of profitability. A cross-country analysis for the period of 1993 to 1998 of 14 Islamic banks from 8 countries was done. Return on asset (ROA) and return on equity (ROE) were considered as dependent variables. The results showed that the boost in loan ratios and capital stimulates the dependent variable positively. Alternatively, Malaysian banks' profitability during the period 1986 to 1995 was examined by Guru et al. (2002), who used a sample of 17 commercial banks. The profitability determinants were categorized as, namely, the internal (liquidity, capital adequacy, and expenses management) and

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external (ownership, firm size, and economic conditions). The study found efficient expenses management as one of the most significant moves to explain higher profitability.

The Saudi banks were studied by Ahmed and Khababa (1999), where they used ROE, ROA, and percentage change in earnings per share as dependent variables and determinants for profitability. As independent variables market concentration, business risk, market size were used. They found that bank size and business risk are the main determinants of performance.

Kim and Kim (1997) worked with US and Korean banks to study the structure-profit relationship of commercial banks where ROA and ROE were the measures for profitability. On the other hand, seven independent variables were total loans to total deposits, shareholders' equity to total assets, liquid assets to assets, total borrowed funds to total assets, reserves for loans to total assets, fixed assets to total assets, and a reciprocal value of total assets. According to the empirical findings, capitalization rate, reserves for loan losses, and size of the bank were important factors to affect profitability in both countries. In terms of efficiency and profitability, US banks were found to be more profitable compared to the Korean ones.

A large number of empirical studies have been conducted on commercial banks' performances around the world (Yeh, 1996; Lacewell, 2003; Halkos & Salamouris, 2004). However, little has been done on the performance of the new banks in Bangladesh. In addition to that, to our knowledge, comparative studies similar to ours using OLS regression analysis between ROA, ROE and NPL ratio, cost to income ratio, loan to deposit ratio, cost of fund, capital adequacy ratio, debt to equity ratio, and bank size are not available in the context of Bangladeshi Banks. The findings of this paper will provide great impetus to the policymakers to implement additional measures to ensure financial stability and greater competition in the banking sector.

3. Research Methodology

3.1. Sample selection criteria and data sources

The main focus of this research is to find out the linear relationship between banks' profitability and some firm specific accounting variables. For this purpose, two distinct types of the clusters of the samples: fourth generation banks and top banks are selected for this study. Fourth generation banks are selected based on their establishment year, which got approval to commence their activities between 2013-2016. Eight fourth generation banks out of nine were considered in this study based on the availability of the data. On the other hand, another eight banks were considered as the top banks. The selection criterion for the top banks included the banks that have high ROA and ROE than the total banking average from 2013-2018. Financial statements of the sample banks, Bangladesh Bank website, Dhaka stock exchange website, and Lanka Bangla Financial portal were used for the collection of the bank specific accounting variables for the year 2013-2018.

3.2. Variable measurement

Return on asset (ROA) and Return on equity (ROE) are used as the dependent variable for this study, which has been aligned with several empirical evidence. Ta Ho and ShunWu (2006), Beck et al. (2008), and Sinkey (2002) proclaimed these two ratios as

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the best measures of a bank's overall performance. Return on assets (ROA) and Return on equity (ROE) are also used in other researches as largely influential ratios to measure financial performance (Sufian & Habibullah, 2009b; Kosmidou, 2008; Siddiqui, 2008; Williams, 2003; Naceur & Goaied, 2001; Berger, 1995). In this study, seven accounting variables are regressed against ROA and ROE. The variables used to proxy profitability, and its determinants are specified in the table below:

Table 1: Descriptions of the variables

Variable	Description	Econometric Symbol
	Dependent Variables	
Return on Asset	Net income/Total asset	ROA
Return on Equity	Net income/Total equity	ROE
	Independent Variable	
NPL Ratio	Non-performing loan/ Total loan	x_1
Cost to Income	Operating expense/Operating income	x_2
Loan to Deposit	Total loan/Total deposit	x_3
Cost of Fund	Total interest expense/Average interest bearing deposit	x_4
Capital Adequacy	(Tire 1 capital +Tire 2 capital)/Risk weighted asset	x_5
Debt/ Equity	Total liability/Total equity	x_6
Market Size	Logarithm of Total asset	x_7

Source: Author's own elaboration

The relationship between credit risk and profitability in banking is investigated in different studies. Many of the empirical evidence used non-performing loan ratio as a proxy for credit risk and found the negative relationship between credit risk and profitability (Islam & Nishiyama, 2016; Jackson et al., 1999). Jackson et al. (1999) also recommend that poor quality of lending increases the loan loss provision, which leads to non-performing loans and actual losses. On the other hand, Duca and McLaughlin (1990) proclaimed that an increase in non-performing loans increases the profitability of banks.

It can be assumed that cost has a negative relationship with the profitability as more expense has a negative impact on the profitability (Bourke 1989). But empirical evidence also suggests the reverse scenario. However, Molyneux and Thornton (1992) indicated that the company that has high operating expenditure could have high profit too. They opinioned that this high operating profit can be a byproduct of higher payroll expenditures paid to more productive human capital. Moreover, the loan to deposit ratio is a crucial ratio for measuring the efficiency of any bank's performance. Though Al-Tamimi (2010) did not found any significant relationship between loan to deposits and bank profitability, it has been considered as an influential factor of bank's performance in other researches.

Even though regulatory capital (capital adequacy ratio) has been demonstrated to be a crucial factor in explaining the performance of banks, its influence on bank profitability is equivocal. For example, it is found that regulatory bank capital has a positive impact on the profitability of African commercial banks (Ozili, 2017). On the other hand, Aggarwal and Jacques (2001), Barth et al. (2008), and Berger and Bouwman (2013) found an insignificant relationship between regulatory capital and bank profitability.

A higher debt to equity ratio suggests a relatively risky position; one might expect a negative coefficient on this variable (Berger, 1995). Empirical results are also ambiguous for the debt to equity ratio. Ozili (2015), Eichengreen and Gibson (2001)

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found that leverage or the debt has a positive impact on the profitability of banks. On the other hand, Molyneux (1993) concluded that more equity has a positive relationship with the profitability of a bank.

Bank size (LOGTA) has an impact on the cost differences and risk diversification of the financial institution. Many of the empirical evidence supports a positive relationship between size and bank profitability (Goddard et al. 2004, Bikker and Hu 2002; Akhavein et al. 1997; Molyneux & Thornton 1992; Bourke 1989). Again, researchers also found that the effect a growing bank's size have on profitability is positive but up to a certain limit (Eichengreen & Gibson, 2001)

3.3. Econometric Model

The ordinary least square method is implemented for this study. The methodology is reasonable and acceptable for this research as it is based on a number of preceding studies that investigated the banking sector's profitability as a whole. The models used for this study are enlisted below:

Model I: Return on Asset (ROA):

$$ROAit = \alpha + \beta\kappa_1 x_1it + \beta\kappa_2 x_2it + \beta\kappa_3 x_3it + \beta\kappa_4 x_4it + \beta\kappa_5 x_5it + \beta\kappa_6 x_6it + \beta\kappa_7 x_7it + uit..... (1)$$

Model II: Return on Equity (ROE):

$$ROEit = \alpha + \beta\kappa_1 x_1it + \beta\kappa_2 x_2it + \beta\kappa_3 x_3it + \beta\kappa_4 x_4it + \beta\kappa_5 x_5it + \beta\kappa_6 x_6it + \beta\kappa_7 x_7it + uit..... (2)$$

Where, α = the value of intercept (the profitability in the absence of NPL ratio, cost to income ratio, loan to deposit ratio, cost of fund, capital adequacy ratio, debt to equity ratio, and market size)

$\beta\kappa_1$= the partial change in bank profitability due to one percentage change in NPL ratio while other factors remain constant

$\beta\kappa_2$= the partial change in bank profitability due to one percentage change in cost to income ratio while other factors remain constant

$\beta\kappa_3$= the partial change in bank profitability due to one percentage change in loan to deposit ratio while other factors remain constant

$\beta\kappa_4$= the partial change in bank profitability due to one percentage change in cost of fund ratio while other factors remain constant

$\beta\kappa_5$= the partial change in bank profitability due to one percentage change in capital adequacy ratio while other factors remain constant

$\beta\kappa_6$= the partial change in bank profitability due to one percentage change in debt toequity ratio while other factors remain constant

$\beta\kappa_7$ = the partial change in bank profitability due to one unit change in market size while other factors remain constant

i = bank, t = time period, and uit = error term

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4. Results and Findings

4.1. Descriptive Statistics

Table 2 exhibits the descriptive statistics of fourth generation banks, and Table 3 represents the descriptive statistics of top banks for all dependent and independent variables. The values of mean show the arithmetical average of all the variables, and standard deviation reports the variability or diversity in the data set for each variable. Low standard deviation shows that the data points are extremely inclined and close to the mean; high standard deviation indicates that the data set is not symmetric and has many extreme values.

Table 2: Descriptive statistics of fourth generation banks

	ROA	ROE	NPL Ratio	Cost to Income	Loan to Deposit	Cost of Fund	Capital Adequacy	Debt/ Equity	Size (billon)
Mean	0.97%	7.14%	0.68%	55.47%	77.47%	3.00%	34.23%	614.32%	39.72
SD(σ)	0.23%	2.20%	0.31%	3.94%	5.28%	0.60%	12.92%	139.23%	9.65
Max	1.61%	13.06%	1.88%	69.54%	89.68%	4.50%	97.08%	990.10%	70.45
Min	0.27%	0.63%	0.00%	46.56%	54.06%	0.38%	15.20%	106.25%	8.91

Source: Author's own elaboration form Descriptive Statistics Output

Table 3: Descriptive statistics of top banks

	ROA	ROE	NPL Ratio	Cost to Income	Loan to Deposit	Cost of Fund	Capital Adequacy	Debt/ Equity	Size (billon)
Mean	0.92%	13.27%	3.58%	47.49%	91.12%	3.52%	12.82%	1363%	287.92
SD(σ)	0.02%	0.16%	0.08%	0.24%	2.10%	0.20%	0.14%	40%	27.66
Max	0.97%	13.65%	3.83%	48.58%	97.29%	4.05%	13.40%	1478%	204.24
Min	0.85%	12.72%	3.37%	46.74%	85.18%	2.77%	12.38%	1237%	384.16

Source: Author's own elaboration form Descriptive Statistics Output

4.2. Correlation Matrix

Pearson Product Moment Correlation Coefficient is done for the independent variables to get an overall idea about the intensity of the relationship among the independent variables. The correlation matrix among the variables of fourth generation banks and top banks are given respectively in the table 4 and table 5. In the case of fourth generation banks, the highest intensity of relation is found between the capital adequacy ratio and loan to deposit and the lowest intensity in between debt to equity and cost of fund. On the other hand, in the case of top banks, cost of fund and NPL ratio has the highest intensity of the relationship, and market size has the lowest intensity of relationship with capital adequacy ratio. Moreover, from the correlation matrix, we also find that, except for the capital adequacy ratio and loan to deposit ratio of fourth generation banks, there is no multicollinearity among the independent variables as no correlation between them is more than 8.

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Table 4: Correlation matrix of independent variables of fourth generation banks

	NPL ratio	Cost to Income	Loan to Deposit	Cost of fund	Capital Adequacy	Debt/ Equity	Market Size
NPL ratio	1						
Cost to Income	-0.25	1.00					
Loan to Deposit	0.39	-0.12	1.00				
Cost of fund	0.31	-0.34	0.20	1.00			
Capital Adequacy	-0.34	0.40	-0.83	-0.37	1.00		
Debt/ Equity	0.30	-0.37	0.54	0.05	-0.60	1.00	
Market Size	0.50	-0.63	0.45	0.46	-0.64	0.60	1.00

Source: Author's own elaboration form Correlation Output

Table 5: Correlation matrix of dependent variables of top banks

	NPL Ratio	Cost to Income	Loan to Deposit	Cost of Fund	Capital Adequacy	Debt/ Equity	Market Size
NPL Ratio	1.00						
Cost to Income	0.22	1.00					
Loan to Deposit	-0.38	-0.36	1.00				
Cost of Fund	0.46	0.45	-0.10	1.00			
Capital Adequacy	0.06	0.25	0.04	0.16	1.00		
Debt/ Equity	0.29	0.37	-0.18	0.01	-0.06	1.00	
Market Size	-0.02	0.26	0.06	-0.22	0.00	0.28	1.00

Source: Author's own elaboration form Correlation Output

4.3 Regression Analysis

Table 6 and Table 7 provide a summary of the regression results of the OLS regression model, respectively, for fourth generation banks and top banks by using ROA and ROE as dependent variables. To figure out whether the bank's profitability is affected by NPL ratio, cost to income, loan to deposit, cost of fund, capital adequacy, debt to equity, and market size, the results of the regression are bellowed. For every model, significance level 5% is used. As a result, a model with significance F lower than .05 will be treated as valid or significant and vice versa.

From Table 6, it is found that adjusted R^2 is 75.38% for ROA of the fourth generation banks. It explains that 75.38% of the ROA change can be explained by the independent variables used in this model, and the remaining portion of the change is an effect of other variables that are not included in this research. In the case of ROA, the estimated coefficient of cost to income ratio, cost of fund, and debt to equity ratio are statistically significant at 5% significance level. On the other hand, NPL ratio, loan to deposit ratio, capital adequacy ratio, and market size have an insignificant relationship with profitability. In our study, the relationship between the cost of fund and ROA is revealed positive. Though this result seems to be unexpected, it is aligned with the previous study (Al-Tamimi, 2010). The coefficient of the cost to income, debt to equity ratio is negative. The negative relationship between cost and profitability is also found in other empirical resources (Sufian, 2012; Guru et al., 2002; Bourke 1989). Moreover, the result derived for the debt to equity and profitability is also identical with previous studies (Berger, 1995; Molyneux; 1993).

In the case of ROE of fourth generation banks, the adjusted R^2 is 65.71%. From the coefficient values, it is found that cost to income has a significant negative relationship, and loan to deposit ratio has a significant positive relationship with ROE at a 5%

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significance level. Moreover, NPL, cost of fund, capital adequacy, debt to equity ratio, market size has no significant relationship. The negative relationship of ROE with cost to income is aligned with literature (Kosmidou, 2008). On the other hand, the positive relationship between loan to deposit ratio and ROE is also consistent with empirical findings (Bashir 2003).

Table 6: OLS regression result for fourth generation banks

	ROA		**ROE**	
R^2	0.7905		0.7082	
Adjusted R^2	0.7538		0.6571	
Sig F	1.01E-11		5.9E-09	
Intercept	0.4725		-22.7980	
	Coefficient	**P value**	**Coefficient**	**P value**
NPL Ratio	5.5884	0.4592	50.0990	0.4386
Cost to Income	-3.5999	0.0000*	-20.4666	0.0001*
Loan to Deposit	0.6031	0.3835	14.4258	0.0183*
Cost of Fund	14.6186	0.0000*	41.9542	0.1220
Capital Adequacy	0.3575	0.3398	5.5448	0.0878
Debt/ Equity	-0.0434	0.0291*	0.2852	0.0903
Market Size	0.1621	0.6001	2.3730	0.3719

* P<.05.

Source: Author's own elaboration form Correlation Output

In contrast to fourth generation banks, a different result is found from the regression models of the top banks. From table 7, it is found that adjusted R^2 is 39.85% for the ROA model. That means only 39.85% change of ROA of the top banks can be explained by the independent variables considered in this model. The coefficient values for the ROA model show that cost to income has a significant positive relationship, and debt to equity ratio has a significant negative relationship with ROA at a 5% significance level. Apart from this, all other remaining variables exhibit insignificant relationships.

For the ROE model of top banks, the adjusted R^2 is found 38.04%, which is distinctively lower than the fourth generation banks. Cost of fund and debt to equity ratio reveal a significant positive relationship with ROE, which is consistent with the previous studies (Ozili, 2015; Akhtar et al., 2011; Eichengreen and Gibson 2001). Conversely, ROE of the top banks' has a negative relationship with NPL ratio. The relationship between the non-performing loan and ROE is consistent with many of the empirical evidence (Ariyadasa et al., 2017; Islam and Nishiyama, 2016; Jackson et al., 1999). On the other hand, ROE has an insignificant relationship with cost to income, capital adequacy, loan to deposit ratio, and market size at a 5% significance level.

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Table 7: OLS regression result for top banks

	ROA		ROE	
R^2	0.4881		0.4727	
Adjusted R^2	0.3985		0.3804	
Sig F	0.000191195		0.000322	
Intercept	0.0212		0.0726	
	Coefficient	**P value**	**Coefficient**	**P value**
NPL Ratio	-0.0608	0.0745	-1.0893	0.0365*
Cost to Income	0.0048	0.4248	0.0541	0.5542
Loan to Deposit	-0.0002	0.9589	-0.0228	0.7557
Cost of Fund	0.1223	0.0020*	2.1431	0.0005*
Capital Adequacy	0.0091	0.7662	0.2753	0.5551
Debt/ Equity	-0.0004	0.0177*	0.0048	0.0423*
Market Size	-0.0011	0.5995	-0.0072	0.8157

* P<.05.

Source: Author's own elaboration form Correlation Output

Comparing each bank cluster (fourth generation banks & top banks) individually, distinguished results on the factor's intensity of influences were derived at a 5% significance level. According to the coefficient found from the regression model, the ROA of fourth generation banks has a significant relationship with cost to income, cost of fund, and debt to equity ratio. However, the nature is positive for cost of fund and negative for the cost to income and debt to equity ratios. In contrast with that, the ROA of top banks has a significant positive relationship with the cost of fund, negative relationship with debt to equity ratio.

On the other hand, the fourth generation banks and top banks also showed multivariate results for ROE. The ROE of the fourth generation banks is significantly influenced by cost to income and loan to deposit ratio. Conversely, ROE of the top banks has a significant negative relationship with NPL, and a positive relationship with cost of fund, and debt to equity ratio.

5. Conclusions

This study attempts to investigate the impact of the bank-specific factors on the performance of Bangladeshi banks. This study used two clusters of samples that are composed of fourth generation banks and top banks of Bangladesh for the period of 2013 to 2018. ROA and ROE are the two dependent variables alongside the independent variables NPL, the cost to income, loan to deposit, cost of fund, capital adequacy, debt to equity, and market size. Though both theoretical framework and previous empirical findings gives a solid ground for those independent variables, the findings are not unequivocal. Different clusters (fourth generation & top banks) of the data results in different interpretations about the factor's intensity on the bank's profitability.

When each bank cluster was treated individually, we found that the ROA of fourth generation banks has a significant positive relationship with cost of fund and negative relationship with cost to income and debt to equity ratio. On the other hand, ROE of the fourth generation banks has a positive relationship with loan to deposit ratio and negative relationship with cost to income ratio. No significant relationship is found for the other explanatory variables NPL, capital adequacy, and market size. These

insignificant relationships are distinct from many empirical findings (Batten & VinhVo, 2019; Al-Homaidi et al., 2018; Islam & Nishiyama, 2016; Berger & Bouwman, 2013; Akhtar et al., 2011; Ramlall, 2009; Kosmidou, 2008; Spathis et al., 2002). Low asset base, insignificant NPL, and a high level of capital adequacy ratio of the fourth generation banks for the studied fiscal years can be a reason behind these insignificant relationships.

In contrast with that, ROA of top banks has a significant positive relationship with cost of fund and a significant negative relationship with debt to equity ratio. On the other hand, ROE of the top banks has a significant positive relationship with cost of fund and debt to equity ratio, and negative relationship with NPL ratio. This result can be considered justified, as big bank usually have large loan portfolio which increases their cost of fund and also induce a larger amount of non-performing loan. This non-performing loan creates loan losses and increases the possibility of net loss (Jackson et al., 1999).

After considering two clusters of the banks' data collectively, it is found that, though none of the independent variables has same nature and intensity of relationship with ROE, the result is symmetrical for ROA. From our analysis, it can be inferred that cost of fund is the common significant positive control catalyst for both (Fourth generation & Top bank) bank cluster's ROA. Conversely, debt to equity is a significant negative control catalyst.

From these findings, we can refer that, if the interest cost of the debt cannot be offset by substantial growth in revenues, the extra debt burden would shrink the bank's profitability. In a worst-case scenario, it would devastate the bank financially and result in liquidation and eventual bankruptcy. Proper attention to the capital structure of the bank is expected from the policymaker and regulators to ensure the expected profitability and growth of a bank in this exceedingly competitive financial environment. Data availability is one of the major limitation of this study. As this study considered the fourth generation banks, as a result the analysis has to be done on a small sample size. The availability of longer data coverage could have ensured better results. Further research can be conducted by using more time series data with diverse set of control variables.

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Appendix A:

Table A-1: Lists of Fourth Generation Banks

Sr.	
1.	Meghna Bank Limited
2.	Midland Bank Limited
3.	Modhumoti Bank Limited
4.	NRB Bank
5.	NRB Global Bank
6.	NRBC Bank
7.	South Bangla Agricultural & Commerce Bank Limited
8.	Union Bank Limited

Table A-2: Lists of Top Banks

Sr.	
1.	Bank Asia Limited
2.	Brac Bank Limited
3.	Dhaka Bank Limited
4.	Dutch Bangla Bank Limited
5.	Eastern Bank Limited
6.	Islami Bank Bangladesh Limited
7.	ShahjalalIslami Bank Limited
8.	Trust Bank