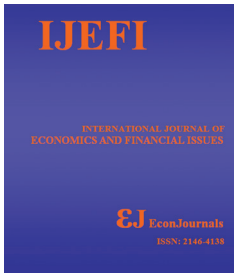

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Unlocking Profitability: Exploring the Impact of Bank-Specific and Macroeconomic Determinants on Return on Equity in Commercial Banking Sector of Bangladesh

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ABSTRACT

This study investigates the factors influencing return on equity (ROE) within the banking sector of Bangladesh by analyzing a comprehensive dataset spanning from the year 2011 to 2020. Utilizing a combination of econometric techniques, including the one-step difference GMM, Driscoll-Kraay estimator, and panel-corrected standard errors (PCSE) methods, this study analyzes the influence of various bank-specific and macroeconomic variables. The findings reveal a nuanced pattern of impact on ROE. Earnings per share (EPS), capital adequacy ratio (CAR), and bank spread exhibit a significant positive influence on ROE, reflecting the importance of profitability, capital strength, and interest rate spreads. Conversely, asset size, operating cost to loans ratio, total equity to debt ratio, and inflation exert a significant negative impact on ROE, highlighting the challenges associated with growth, cost efficiency, leverage, and inflationary pressures. These findings provide a multifaceted perspective on the dynamics of ROE, offering valuable insights for banks and policymakers striving to optimize financial performance and stability in the ever-changing economic landscape.

Keywords: Profitability, Return on Equity, Dif-GMM, PCSE, Driscoll-Kraay, Bangladesh
JEL Classifications: E7, G2, M2

1. INTRODUCTION

Financial intermediaries are performing indispensable financial activities in the economy of any country by providing payment appliances, handling convoluted financial mechanisms and executing risk management activities in developing financial services. The banking sector as an intermediary has experienced a better expansion in the size of the market and socioeconomic development than before (Reaz and Arun, 2006). It performs a vital role in the transaction of most economic activities. Likewise, it also assists in the growth of the economy. On the other hand, insolvencies in banks may result in banking or financial crisis (Ahamed, 2021). So, a country that has a profitable banking sector is mostly able to combat negative disturbances in the financial system. For this purpose, it is crucial to recognize the determinants of the profitability of the banking sector. The banking sector in Bangladesh has generally taken a valuable position in the whole financial system which is structured based on the framework that is universally accepted to serve the financial market through legally accepted banking and financial activities (Mujeri and Younus, 2009; Nimalathasan, 2008; Reaz and Arun, 2006). Most of the activities done by the banking sector are very significant to the growth of the economy in Bangladesh. Since 1971, the banking sector is trying to grow and influence the economy to a great extent (Arefin and Islam, 2019). For this purpose, it is crucial to identify the factors that are closely related to increasing the profitability of banks.

A bank's return on equity (ROE) is a key indicator of its capacity to produce profits for its shareholders as well as a fundamental measure of its financial performance and profitability (Akbar, 2021). Examining the many variables that affect ROE in the

banking industry is crucial as the world's financial landscape is always changing. This study aims to investigate the intricate interactions that macroeconomic factors and bank-specific characteristics have on ROE. In particular, we investigate a number of crucial macroeconomic and bank-specific variables to understand how they affect ROE. Determinants of bank profitability is a contentious area.

The profitability of banks has become a momentous topic of scrutiny all over the world. Bangladesh, a supremely bank-based economy, is not without the trend of inspecting the factors that demonstrate profits. As the competition in the banking sector is becoming higher and higher, this flourishing sector requires some academic studies that will identify the determinants of banks' profitability and their relation with earning profit. Typically, the profitability of banks is influenced by bank-specific and macroeconomic factors. Therefore, this study considers bank-specific and macroeconomic determinants that largely influence the banking sector's profitability in the context of Bangladesh. Asset size, earnings per share (EPS), capital adequacy ratio (CAR), operating cost to loan ratio, and total equity to debt ratio are the bank-specific factors considered. These variables capture the key components of a bank's size, profitability, capital strength, effectiveness, and financial structure. Additionally, inflation and bank spread are the two macroeconomic factors that represent the overall economic climate in which banks operate. Additionally, inflation and bank spread, two macroeconomic factors, represent the overall economic climate in which banks operate.

For financial institutions, policymakers, and regulatory authorities, it is crucial to comprehend the complex interaction between these factors and how they affect ROE. These insights can assist in creating policies aimed at promoting a resilient and stable banking industry as well as strategic choices, risk management techniques, and practices. As a result, this study aims to clarify the complex dynamics of ROE, ultimately contributing to a more informed and sustainable financial landscape. It aims to understand better the complex factors influencing the financial performance of commercial banks in Bangladesh. Also, it seeks to shed light on how numerous bank-specific and macroeconomic drivers affect return on equity (ROE), which is a crucial indicator of a bank's profitability. This study might also help to provide insightful guidance to banks in improving their financial strategies and support policymakers in fostering a robust and stable banking system by analyzing the relationships between the studied variables and ROE. The insights can help bankers make better strategic choices and increase profitability, benefiting their institutions and shareholders. Policymakers and government representatives can use the findings to create economic policies and banking laws that are more effective, promoting stability and growth in the banking industry and the overall economy of Bangladesh.

From this study, it could be doubtlessly said that this topic is crucial and advisory to all bankers who will use it for administrative purposes. Indeed, this study will certainly be essential for Bangladesh's banking sector as Bangladesh's economy is very sensitive to the performance of the banking sector. This study found that the bank-specific and macroeconomic determinants greatly impact the banks' profitability. It found that some factors positively and some negatively impact the bank's profitability. However, banks should be more concerned about bank-specific factors as the macroeconomic factors cannot be controlled. Moreover, the banks are increasing the number of branches and employees, but the profitability is not increasing comparatively. So, relevant and respective procedures should have to be taken so that the resources can be used potentially. Lastly, it is crucial to say that coordination among the government, lawmakers, employees, management, etc. can upgrade the efficiency and profitability of banks, ensuring the sustainable progression of our financial system. Managing the complex environment of commercial banking in Bangladesh requires a thorough understanding of the interaction between bank-specific and macroeconomic drivers. These insights can be used by policymakers, regulators, and industry participants to develop plans that will help the banking industry become more profitable and resilient.

Many researchers from different countries have tried to identify the impacts of the several determinants on the profitability of banks (Anbar and Alper, 2011; Hossain and Golder, 2022; Kamande, 2017; Zhang and Daly, 2014). In contrast to earlier studies that focused either on the static estimation process or the dynamic estimation process, this study simultaneously estimated both by presenting data from both the static (Driscoll-Kraay and Prais-Winsten panel corrected standard errors [PCSEs]) and dynamic (difference generalized methods of moments [Dif-GMM]) estimation processes considering data from Bangladesh.

The following is a summary of the study: There exists a review of the previous literature in Section 2. The applied approach and sources of data are presented in Section 3. Section 4 of the report discusses the findings. Finally, Section 5 includes pertinent policy stances.

2. THEORETICAL LITERATURE REVIEW

This study aims to determine how bank-specific and macroeconomic factors impact Bangladeshi commercial banks' return on equity (ROE). ROE is one of the well-liked metrics for assessing the financial performance of banks. Greater ROE gives businesses a competitive edge over rivals, which translates into better investor returns (Kharatyan et al., 2017). Although some macroeconomic factors also substantially impact this profitability ratio, many bank-specific factors operate as the most important determinants of ROE. Banks of Bangladesh, like those in many other countries, are worried about a variety of macroeconomic and bank-specific factors that influence banks' profitability. Significant bank-specific criteria include bank size, various operating and profitability ratios, earnings per share, non-performing loans, etc. Additionally, among macroeconomic factors worth mentioning are interest rate, inflation rate, gross domestic product, bank spread, etc.

Without the financial sector's profitability, associated parties will be less inclined to manage their businesses, which could cause a country's economy to become disorganized. Concentrating on several economic factors that also impact the profit scenario of banks, central banks and governments of various nations are

committed to ensuring economic growth. Numerous earlier studies examined how different macroeconomic factors and bank-related issues affect banks' profits (Hossain and Ahamed, 2015; Islam and Mosharrafa, 2021).

Anbar and Alper (2011) collected data from the year 2002 to 2010 from selected 10 banks of Turkey and reported that the size of assets of a bank and non-interest income (NIM) have a positive connection to increase the profitability power of a bank. On the other hand, the size of outstanding loans and loans under observation of the banks has a devastating influence on banks' profitability. They also used thirteen independent variables to identify their effect on banks' profitability. Likewise, Brissimis and Delis (2008) used the popular structure-conduct-performance (SCP) hypothesis to observe the impact of bank-specific, industry-specific, and macroeconomic determinants on banks' profitability. They covered about 12 years, from 1985 to 2001, by applying GMM techniques to the banks of Greece. They found that capital and labor productivity have a great positive impact on the profitability of banks. Operating expenses had a negative influence on the profitability of banks. On the other hand, among macroeconomic variables, periodic output and inflation shape the accomplishment of the banking industry.

Any country's banking system depends on the bank's precise and macroeconomic factors of profitability (Masood et al., 2015). Acquirements of banks are computed mostly by their earning and the level of profitability. Profitability generally shows the difference between total earnings and total cost. So, the ingredients that affect banks' revenue and cost would affect banks' ultimate profitability. Bhattarai (2018) examined the domination of bank-precise and macroeconomic factors in the attainment of 17 commercial banks of Nepal for the period 2011-2016. He used regression model, and the output showed that cost per loan assets mainly influences banks' performance. He also concluded that macroeconomic variables had an insignificant impact on the performance of banks. As stated in the report of Obamuyi (2013), the performance of banks in Nigeria was unremarkable over the last decade. He scrutinized some important factors of banks such as capital, asset size, and expense management etc., on the profitability of banks. It took 20 banks to gather data over the period 2006-2012. In this report, the positive factors were notable. It showed that the capital of banks, effective expense management, interest income, etc. significantly impact bank performance. Moreover, it mentioned that favorable economic condition also influences greatly on the performance of banks in Nigeria. The report also identified that Nigeria's government always tries to motivate banks to raise capital and manage them efficiently. In addition, Kiganda (2014) implied in his report that commercial banks in Sub-Saharan Africa seem very profitable. The average ROA was about 2% over the last ten years, which was higher than the countries of the world. In order to identify the determinants that impact the profitability of banks, the author took the initiative to study the matter. He also noticed that there were no studies regarding the impact of macroeconomic determinants on the performance of banks in Kenya. So, he decided to focus on macroeconomic factors such as the growth of the economy, inflation and the exchange rate. Here, the sample size was 5 years, from 2008 to 2012. The output showed that the macroeconomic factors had a remarkable influence on the profitability of banks in Kenya. So, he concluded that banks' internal factors greatly impacted their profitability. So, banks should emphasise the factors related to bank management.

Al-Homaidi et al. (2018) aimed to find the factors determining commercial banks' profitability in India. The study took ROA, ROE, and NIM as dependent variables and a set of variables such as asset quality, liquidity, capital adequacy, efficiency in asset management etc., as independent variables. Fixed effect and random effects models and generalized methods of moments (GMM) were built to analyze data of 10 years. The study also considered some macroeconomic factors to determine their impact. The outcome of the study was very interesting. All of the bank-specific factors taken for the study except the number of branches had a cogent impact on banks' profitability measured by the dependent variable NIM. Likewise, some determinants, such as bank size, asset management, number of branches etc., had a higher impact as calculated based on ROA. On the other hand, the report also showed that the macroeconomic variables had a remarkable negative impact on banks' performance.

All the studies mentioned above are completed based on the data of foreign countries. By observing the importance of the topic, many researchers in Bangladesh took great initiative to study the matter. There are also some important reports on the profitability determinants of commercial banking sectors in Bangladesh. But all of them were completed based on some sample banks. None of the studies were done based on the whole commercial banking sector. Hossain and Ahamed (2015) chose the top 15 banks in Bangladesh and collected relevant data from 2012 to 2016. They examined the influence of bank-specific factors on the profitability of banks. The selection of banks was based on the size of the asset. They used regression analysis to analyze the impact. The fixed effect model was used where ROA and ROE were taken as dependent variables. According to ROA, net interest income, asset quality and structure, and management efficiency had a remarkable impact on banks' profitability. Moreover, the strength of capital, industry impact positively connected with ROE. On the other hand, NPL had a negative relation with ROE. The authors concluded that the study might greatly help the banking industry by working as a path to take decisions by investors, policymakers, management committees and other stakeholders. Another report by Rahman et al. (2015) scrutinized many variables, such as the strength of capital, liquidity, the structure of ownership, and liquidity as important bank-specific determinants. They also investigated GDP and inflation as macroeconomic determinants of bank profitability. They considered 25 commercial banks of Bangladesh from 2006 to 2013. They took ROA, ROE, and NIM as dependent variables. The outcome of the result was that the regulatory and equity capital had a positive impact on profitability. It also revealed the efficiency of cost and off-balance sheet activities had negative but significant impact on profitability. Moreover, NII, credit risk and GDP were found to be significant determinants of net net-interest margin (NIM). Likewise, the size of the asset had a positive impact on ROA.

Sufian and Kamarudin (2012) investigated the bank-specific and macroeconomic determinants of commercial bank profitability of the commercial banks in Bangladesh. They took samples from 31 commercial banks and collected information from 2000 to 2010. They used the fixed effect model and tested the study by using Hausman test. They considered six bank-specific determinants such as capital structure, liquidity, quality of management etc. They found that all the variables influenced banks' profitability except the asset quality. According to the study, the quality of assets, capital structure, and efficiency of bank management had a positive impact on the profitability of banks. On the other hand, non-traditional activities showed a negative collection with profitability. As for the determinants of macroeconomic factors, inflation showed a negative relationship with banks' profitability. According to the study of Lee and Iqbal (2018), the economic activities of a bank become important for the economy of a country. The profitability of the banking sector greatly impacts a country's wellbeing. So, the authors investigated the bank-precise and macroeconomic determinants on the activities of banks. They took 23 banks and collected data from the year 2009 to 2016. They found that interest margin, capital adequacy ratio, and loan to deposit ratio positively impacted the performance measures such as ROA and ROE. On the other hand, they observed a negative impact of the logarithm of total assets and GDP growth rate on the performance of banks.

Based on the author's current level of knowledge and understanding, although many studies have attempted to show the effects of various macroeconomic and bank-specific determinants on the profitability of banks, no study has advanced to inspect the impact taking into account both static and dynamic estimations including the most influencing factors. Understanding this research vacuum, the current study aims to investigate the effects of key determinants on Bangladesh's banking sector.

3. METHODOLOGY

This methodology section describes the variable specifications, econometric models, estimate techniques, and the collected data for this study.

3.1. Variables

This study deals with panel data to investigate the static and dynamic relationship and factors that affect return on equity from the viewpoint of 22 Bangladeshi commercial banks exploring from 2011 to 2020. In order to achieve the study's objectives, the variables were selected in accordance with the available empirical research from previous studies. Table 1 provides comprehensive definitions for each variable. All variables, with the exception of assets, are expressed in decimals form, and the quantity of assets has been adjusted using a natural logarithm to account for big and extreme value bias.

3.2. Econometric Model

This study starts using the following specification to estimate the factors that might affect a bank's profitability based on the variables we have chosen:

$$ROE_{it} = \alpha + \sum_{j=1}^{p} \beta_j X_{it} + \sum_{j=1}^{q} \partial_j CFE_{DUMj} + \sum_{j=1}^{r} \in_j TFE_j + \varepsilon_{it} \quad (1)$$

In the equation (1), α denotes constant, β_i specifies the co-efficient of the explanatory variables, X includes both bank-specific and macroeconomic factors as independent determinants of banks' profitability, i indicates banks, t indicates time, CFE stands for dummy of country fixed-effect and ∂ is the co-efficient of this, TFE notifies dummy of time fixed effect and $\in$ is the co-efficient of time fixed effect. We rewrite the following models for estimation by replacing the independent variables with the required logarithmic forms:

$$ROE_{it} = \alpha + \beta_1 LGA_{it} + \beta_2 EPS_{it} + \beta_3 CAR_{it} + \beta_4 CLA_{it} + \beta_5 TEDE_{it} + \beta_6 BS_{it} + \beta_7 IR_{it} + \sum_{j=1}^{q} \partial_j CFE_{DUMj} + \sum_{j=1}^{r} \in_j TFE_j + \varepsilon_{it} \quad (2)$$

Equation 2 has been organized, focusing on the estimators of the static model. As several of the variables may be subject to endogeneity bias, this equation may not be correctly described in this form, and their direct estimations may produce conflicting results. To control this endogeneity issue, we employ lag of the dependent variable as the current year's return on equity could impact the following year's return, and it might take some time for that to show up in the profitability scenario. This is because we employ a one-period (one-year) lag of ROE with equation (2), and now equation (3) can be rewritten as below:

$$ROE_{it} = \alpha + \beta_1 LG1.ROE_{it} + \beta_2 LGA_{it} + \beta_3 EPS_{it} + \beta_4 CAR_{it} + \beta_5 CLA_{it} + \beta_6 TEDE_{it} + \beta_7 BS_{it} + \beta_8 IR_{it} + \sum_{j=1}^{q} \partial_j CFE_{DUMj} + \sum_{j=1}^{r} \in_j TFE_j + \varepsilon_{it} \quad (3)$$

3.3. Estimation Method

Here, static and dynamic panel data estimators' models are used to derive Equations 2 and 3, respectively. For the static approach, we have used both Driscoll-Kraay and Prais-Winsten PCSEs estimators. Driscoll-Kraay regression aids in addressing problems like cross-sectional dependency, heteroscedasticity and serial correlation in panel datasets by providing robust standard errors (Greene, 2008). Regression with Prais-Winsten PCSEs, on the other hand, extends these advantages to account for both serial correlation and contemporaneous correlation in panel data, making it especially useful when studying longitudinal data with repeated measures on multiple entities to reduce statistical challenges and produce more accurate and dependable results. Dif-GMM approach employing a greater number of instruments and combines the regressions in the levels and the first differences, can produce estimation results with superior accuracy. So, one-step dif-GMM introduced by Arellano and Bover (1995) has been used in this study. Even with small sample sizes, this method delivers accurate parameter estimations and is resistant to problems like serial correlation and heteroscedasticity. Moreover, Dif-GMM can be applied to a variety of economic models because of its adaptability to different types of endogeneity, instrumental variables, and over-identifying restrictions (Bon, 2015; Bujari et al., 2016; Chen and Kao, 2014; Paleologou, 2022).

Table 1: List of selected variables

Variable	Notation	Measurement	Indicators
Dependent variables			
Return on equity	ROE	Return on equity (ROE)=Net Profit/Equity	Profitability
Bank-specific variables			
Asset size	LGA	Natural logarithm of total assets	Financial stability/bank size
Earnings per share	EPS	Net income/shares outstanding	Profits to shareholders
Capital adequacy ratio	CAR	(Tier 1 Capital+Tier 2 Capital)/Risk-weighted assets	Capital strength
Operating efficiency ratio	CLA	Operating costs/total loans and advances	Cost-effectiveness of a bank's lending operations
Total equity debt ratio	TETD	Total equity/total debt	Financial stability and risk management.
Macroeconomic variables			
Bank spread	BS	Interest earned-interest expensed	Effectiveness of interest rate management
Inflation rate	IR	Inflation rate	Impact of external market

Source: Author's contribution

3.4. Data

Data for 22 Bangladeshi private commercial banks covering the years 2011-2020 with no missing values are considered in this study. The list of all chosen banks is shown in the appendix (Table A1). All data was gathered from the Bangladesh bank website.

In addition to potential multicollinearity bias, panel data are frequently prone to autocorrelation, heteroscedasticity, and cross-sectional dependence issues. The statistical judgments may be substantially harmed if these problems are ignored. Breusch and Pagan LM for heteroscedasticity test, Wooldridge test for autocorrelation, variable inflation factor (VIF) test for multicollinearity, and Pesaran's (2004) CD test for cross-sectional dependency have all been used to account for all these concerns. The results of these diagnostic tests, presented in the appendix (Table A2), pointed out heteroscedasticity, autocorrelation, and cross-sectional dependency problems in the static model. According to O'Brien (2007), the mean VIF stat and the correlation matrix in the appendix (Tables A2 and A3) illustrating the general degree of correlations among the variables rule out the existence of multicollinearity. However, in light of these findings, it has been determined that static models with fixed or random effects shouldn't be used as the outcome of diagnostic issues escalates. Thus, this study uses Driscoll-Kraay and Prais-Winsten PCSEs estimators to control the cross-sectional dependency, heteroskedasticity, and serial correlation problems. Additionally, a dynamic model, called a one-step difference GMM, has been used to assess the robustness of the previous two static models.

3.5. Data Summary

The summary statistics for the factors that were observed in the scheduled commercial banks of Bangladesh are shown in Table 2. The standard deviation for each variable is quite low, and the range between the highest and minimum values is also very narrow, indicating consistency in the dataset. It shows that the average return on equity is 0.115, with national bank having the greatest value of 0.283 in 2011 and AB bank having the lowest value of 0.001 in 2018. EPS exhibits a mean value of Tk. 3.007. It exhibits a higher standard deviation of 2.351, indicating the highest variation and a wider gap between minimum and maximum values than other variables. The macroeconomic variables show a small gap between minimum and maximum values, indicating a small deviation in rates from year to year. Additionally, this table shows the descriptive statistics for each variable, including the average value, standard deviation, maximum value, and minimum value of the variables that were considered.

Table 2: Summary statistics

Variable	Obs	Mean	SD	Min	Max
ROE	220	0.115	0.046	0.001	0.283
LGA	220	5.32	0.195	4.83	5.752
EPS	220	3.007	2.351	0.02	21
CAR	220	0.125	0.016	0.09	0.179
CLA	220	0.039	0.024	0.002	0.253
TETD	220	0.094	0.045	0.05	0.403
IR	220	0.066	0.012	0.054	0.088
BS	220	0.047	0.007	0.029	0.056

Source: Authors' computations.

4. RESULTS AND DISCUSSION

The results of the Driscoll-Kraay, PCSE, and one-step Dif-GMM estimation methods, which treat ROE as a dependent variable, are shown in Table 3. The estimations make use of a total of 220 observations for Bangladesh's 22 banks. Both time-based and country-fixed effects are accounted for in all calculations. A good explanatory power of the proposed model is indicated by the R^2 values which is 0.5847 for PCSE and 0.4590 for Driscoll-Kraay estimation in our study. Our investigation supports the hypothesis that the number of groups in the GMM estimation should be bigger than the number of instruments to prevent the estimates from being degraded by too many instruments.

Table 3 suggests that return on equity is significantly affected by its one-period lag. The current year's Return on Equity (ROE) is affected by the previous year's ROE, which signifies a bank's financial performance continuity. When a bank regularly produces high ROE over several years, it can show a history of profitability and effective use of equity. Additionally, a rise in a bank's asset size can cause a decline in return on equity (ROE), due to the influence on leverage. This result is also supported by Islam and Mosharrafa (2021) Banks often need to raise additional capital (equity) to sustain that growth as assets increase. Even though bigger assets could make a greater profit, a gain in equity is not always commensurate in this case. As a result, the equity base increases, which might lower the ROE when gains are distributed into it. In essence, the greater assets that must be supported by higher equity requirements diminish the leverage impact, making it harder for the bank to provide strong returns relative to its equity.

Table 3: Estimations on profitability

Explanatory variables	Driscoll-Kraay	PCSE	GMM
L1ROE			0.1803* (0.1038)
LGA	−0.0649** (0.0215)	−0.0890*** (0.0271)	−0.1868** (0.0770)
EPS	0.0162** (0.0053)	0.0134*** (0.0020)	0.0151* (0.0083)
CAR	0.0573 (0.2796)	0.1417 (0.1775)	1.6608* (0.8630)
CLA	−0.2129** (0.0930)	−0.2552*** (0.0883)	−0.1828* (0.0965)
TETD	−0.1937*** (0.0512)	−0.1278** (0.0585)	−0.3022*** (0.0720)
IR	0.2720 (0.3971)	0.0799 (0.4720)	−1.4400** (0.5971)
BS	0.0686 (0.6781)	−0.0117 (0.6770)	1.2056** (0.4808)
Constant	0.4097*** (0.1147)	0.5485*** (0.1713)	
	0.4590	0.5847	
Prob > χ^2	0.0000	0.0000	
No. banks	22	22	22
No. observations	220	220	176
AR (1)			−2.06**
AR (2)			−1.42
Sargan test			99.09***
Hansen test			14.81
No. of groups	22	22	22
No. instruments			20

Triple asterisk (***), double asterisks (**), and single asterisks (*) refer to levels of significance at 1%, 5%, and 10%, respectively. Figures in parenthesis () indicate robust standard errors. Source: Authors' computations.

As asset size grows, this dynamic causes the ROE to decline. Here, both static and dynamic assessments consistently reveal that the implications are significant.

Moreover, utilizing all of the methods, it is clear that EPS affects ROE positively and significantly. By increasing the profitability component of ROE, earnings per share (EPS) can have a beneficial effect on return on equity (ROE) (Pasiouras and Kosmidou, 2007). The numerator (Net Income) in the ROE formula grows as a result of an increase in a company's earnings. Because it measures the return in relation to shareholders' equity, this raises ROE. Companies' ROE increases when they successfully raise earnings without also increasing equity, indicating superior financial performance and maybe luring new investors. The positive link between EPS and ROE highlights the importance of profit growth in boosting a company's return on equity.

According to the result of the one-step Dif-GMM method, capital adequacy ratio increases ROE significantly. By increasing investor trust and lowering risk, a rise in the capital adequacy ratio (CAR) can raise banks' return on equity (ROE). In this case, investing in a bank is safer because a higher CAR indicates that the bank can withstand losses. The bank may draw in more money as confidence rises, allowing it to build its asset base and, consequently, its profitability. These thoughts are supported by Spaseska et al., (2022). On a different note, operating costs to total loans ratio decreases ROE negatively and both the static and dynamic estimators consistently confirm this relationship. By degrading profitability, an increase in the operating costs to total loans ratio can lower a bank's return on equity (ROE). Rising operating costs as a share of total loans indicate that a bigger portion of the bank's revenue is going toward managing its loan portfolio, which results in lower earnings for shareholders. Lower ROE is the outcome of this decreased profitability divided by shareholders' equity. Higher operational costs can also put more strain on the bank's finances, which increases risk and has a negative impact on ROE because the possible return is proportionately lower with higher operating costs.

A corporation's return on equity (ROE) can be impacted by changes in the total equity to debt ratio since they signal a lesser reliance on debt as a source of funding. Equity often yields a lesser return even though it is less expensive than debt. The amount of financial leverage used by a corporation to boost earnings decreases as it moves toward more equity and less debt. Essentially, a greater equity-to-debt ratio suggests a more conservative financial structure, which can limit the potential for better ROE due to the smaller leverage effect while also decreasing risk.

Using the GMM method, we notice a significant impact of the selected macroeconomic variables on ROE. When the inflation rate increases, it decreases ROE. Due to its effects on interest rates and purchasing power, inflation can lower return on equity (ROE). When inflation increases, a company's earnings lose some of their purchasing power, which reduces the actual return on equity. In addition, central banks frequently increase interest rates in an effort to combat inflation. A company's borrowing expenses may rise with higher interest rates, lowering profitability and ultimately lowering ROE. Since actual profitability is difficult to sustain or boost in an inflationary environment, inflation depreciates earnings and has an impact on capital costs, both of which can harm a company's ROE. A bank's return on equity (ROE) may be positively impacted by a rise in its spread, which is the distinction between the interest rates it pays on deposits and the rates it charges on loans. A wider spread means that the bank is making more money from lending than it is spending on funding (Pasiouras and Kosmidou, 2007). Divided by shareholders' equity, this increased income increases ROE. In essence, a wider spread denotes increased profitability, making the bank more effective at deriving profits from its core banking activities, which in turn boosts ROE and can draw investors looking for higher returns.

5. CONCLUSION AND POLICY DIRECTIONS

This research article, focusing on the dependent variable return on equity (ROE), has examined the complex impact of bank-specific and macroeconomic drivers on the profitability of 22 commercial banks in Bangladesh. This study used both dynamic and static approaches considering from the year 2011 to 2022. The study took into account a number of important independent variables, shedding light on their individual and combined contributions to the profitability of commercial banks, such as asset size of banks, earnings per share (EPS), capital adequacy ratio, bank spread, inflation rate etc.

The findings of this study reveal that a bank's asset size plays a pivotal role in determining its profitability. Due to the size of their operations, banks frequently have higher operational expenses. Managing a vast network of branches, technology infrastructure, and compliance needs can be expensive. These greater operating expenses may eat away at earnings and lower ROE. Additionally, the importance of earnings per share (EPS) in enhancing bank profitability is crucial, emphasizing the significance of sound financial performance in generating shareholder returns. Furthermore, maintaining a healthy capital adequacy ratio is essential for absorbing potential losses and ensuring the stability of banks, and this research confirms its positive association with ROE. The management of the spread between interest income and interest expenses, alongside vigilance regarding the inflation rate, also emerged as critical factors impacting commercial banks' profitability.

Several policy recommendations might be taken into consideration to improve the profitability and stability of commercial banks in Bangladesh based on the empirical findings offered in this study. First and foremost, policymakers and regulators need to concentrate on preserving effective macroeconomic stability, notably by putting measures in place to manage inflation rates, which have been found to have a major adverse influence on bank profitability. Second, to increase profitability, it is important to promote responsible risk management techniques and effective operational cost management. Profitability can be increased by supporting measures to maximize net interest spreads and ensuring that banks maintain high capital adequacy ratios. Thirdly, with an emphasis on earnings per share (EPS), policymakers may also think about enacting measures that encourage sustainable earnings growth. Last but not least, planning for the creation of a balanced regulatory framework that supports the long-term health and prosperity of commercial banks in Bangladesh should be guided by regular monitoring and assessment of the banking industry, taking into consideration both macroeconomic and bank-specific aspects. However, increasing the profitability of commercial banks in Bangladesh through policy execution faces a number of difficulties. It is difficult to create efficient rules that address the varied needs and organizational setups of banks of all sizes. It is a hard undertaking to strike a balance between bank-specific issues like capital sufficiency and cost efficiency and macroeconomic stability, such as controlling inflation. Furthermore, it might be difficult to translate research results into policies that can be implemented while taking into account stakeholder interests and regulatory frameworks. Lastly, commercial banks in Bangladesh face persistent difficulty in their quest for profitability in maintaining flexible policies responsive to changing financial markets and economic conditions. So, it is crucial to say that the coordination among the government, lawmakers, employees and management can upgrade the efficiency and profitability of banks, which will ensure sustainable progression of our financial system.

This study has some limitations. It concentrates on a particular set of independent variables, even if they are significant determinants, other pertinent aspects that may affect the profitability of commercial banks but are not taken into account in this analysis. Furthermore, because the study's scope is limited to the banking industry in Bangladesh, it is possible that its conclusions cannot be fully extrapolated to other nations or areas with different economic climates and regulatory frameworks. Besides, this research skips over the qualitative facets of bank operations, which could offer a deeper understanding of the mechanisms underlying profitability dynamics. Further study in this area will be essential to adjusting banking procedures as Bangladesh's economy develops and guaranteeing the sector's continuous growth and stability in the face of shifting economic conditions.

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APPENDIX

Table A1: List of banks taken into consideration for this study

Sample of private commercial banks in Bangladesh			
AB Bank	Bank Asia	Brac Bank	City Bank
Dhaka Bank	Dutch Bangla Bank Ltd.	Eastern Bank	IFIC Bank
Jamuna Bank	Mercantile Bank	Mutual Trust Bank	National Bank
NCC Bank	ONE Bank	Premier Bank	Prime Bank
Pubali Bank	Southeast Bank	Standard Bank	Trust Bank
United Commercial Bank	Uttara Bank		

Table A2: Diagnostic checks

Name of tests	Statistics	Value
Heteroscedasticity	X^2	34.16
(Breusch and Pagan LM)	P-value	0.0000
Autocorrelation	F- stat	29.263
(Wooldridge test)	P-value	0.0000
Cross-sectional Dependence	F- stat	4.128
Pesaran (2004) CD test	P-value	0.0000
Multicollinearity	Mean VIF	1.815

Source: Authors' computations.

Table A3: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) ROE	1.000							
(2) LGA	−0.278	1.000						
(3) EPS	0.581	0.029	1.000					
(4) CLA	0.020	−0.197	0.208	1.000				
(5) TETD	−0.177	−0.095	−0.082	0.254	1.000			
(6) IR	0.250	−0.737	0.031	0.202	0.145	1.000		
(7) BS	0.203	−0.672	0.030	0.230	0.167	0.693	1.000	
(8) CAR	0.011	0.498	0.223	0.005	0.003	−0.411	−0.507	1.000

Source: Authors' computations.