



Factors Influencing the Profitability of Commercial Banks: An Empirical Study on Listed Banks in Stock Exchange of Bangladesh

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Abstract: The important aspect of the banking industry in Bangladesh is successfully helping to face the financial crisis at present and in the future. This paper explores some factors that influence the profitability of commercial banks. The main objective was to important factors analyze performance decisions as the profitability of commercial banks in Bangladesh. The necessary data was collected from secondary sources. Profitability is measured by return on assets (ROA). A sample of 16 commercial banks out of 32 listed on both DSE and CSE for the period 2016-2020. Profitability measures were calculated and using statistical tools SPSS 25 version through Pearson's correlation, descriptive analysis of variance and regression analysis were utilized in testing the hypotheses and to measure sample banks accounting to their different characteristics. However, the results indicate that there is a significant positive between ROA of banks TCA, TIA and TOEI variables, as well as a negative correlation with the NLBS variable. The regression model reveals that banks specific factors such as TCA, TIA, TOEA and NLBS are influencing factors for the changes in ROA. Further, it is required to strengthen the recommendation that empirical studies should be undertaken in the same field to find out what more specific factors could affect the profitability of commercial banks in Bangladesh.

Keywords: Profitability, Commercial Banks, Factors, Panel Data

1. Introduction

Now in Bangladesh 61 scheduled banks are operational, consisting of 6 state-owned Scheduled Banks, 3 Specialized Banks, 43 Private commercial Banks, 5 Non-scheduled Banks, and 9 Foreign Banks. The Bangladesh Central Bank regulates and supervises all banks in the country. These banks must improve and function well in order to boost the country's economic prosperity, According to Rajan et al. statements; the soundness of the banking sector will determine economic growth [26]. For banks, like for any other business entity, the term "profitability" is critical. It aids in the absorption of costs incurred as a result of bank operations. As a result, it's critical to comprehend the variables that influence bank performance.

In Bangladesh's banking sector, private commercial banks currently have the majority of market share and profitability. Profit factors in accordance with these five determinants from

the data provided in the financial statements are used to assess the soundness degree of a bank's profitability, Guisse [14]. The various financial measures must be measured and aggregated in order to give a relevant picture of a company's financial structure. Bank profitability analysis is critical for all stakeholders involved, including depositors, investors, bank managers, and regulators.

Authors from around the world evaluate the individual aspects that influence bank profitability in various ways. As a result, the return on assets (ROA) was employed as a measure of bank profitability in this study, with important influencing factors such as bank assets, deposits, capital, cash and cash equivalents, investment, operating revenue, operating expenses, and so on taken into account. The goal of this study is to look at the empirical relationship between important factors that affect bank profitability and profitability as a dependent variable. The empirical analysis

is based on data, or more specifically, financial statements produced by 16 commercial banks listed on the Dhaka Stock Exchange Ltd. (DSE) and Chittagong Stock Exchange Ltd. (CSE) in Bangladesh, out of a total of 32 banks, from 2016 to 2020. The analysis consisted of 80 observations.

2. Literature Review

The determinants of bank profitability have been the subject of numerous research by various authors. Nonetheless, the focus of this research will be on the characteristics that were identified as profitability predictors.

Almazari compared between Saudi Arabian and Jordanian banking sectors on the basis of some internal factors such as total investment to total asset ratio, liquidity risk, net credit facilities to total asset ratio, net credit to total deposit ratio, cost to income ratio, total equity to total asset ratio and bank size [1]. He analyzed the financial data for the year 2005-2011 of 161 observations using ratio analysis, Pearson's correlation, descriptive statistics and regression analysis. The study revealed that total equity to total asset ratio had significant positive relation with the return on asset in both banking sector.

Atasoy examined relationship between profitability determinants and structure of expense-income [2]. The results showed that ratio of equity capital and total assets affect ROA positively and ratios of fixed assets and costs to total assets affect ROA negatively.

Athanasoglou, Brissimis & Delis, Profitability of banks is usually expressed as a function of internal and external determinants [3]. This study emphasizes on internal determinants that originate from bank accounts (balance sheets and/or profit and loss accounts), these are capital adequacy, liquidity, operating excellence, asset quality and bank size.

Ataullah et al. made a comparative analysis of commercial banks in India and Pakistan during 1988-1998 [4]. They found that the efficiency score in loan-based model was much higher as compared to the income based model. Both countries banks have needed to improve their efficiency.

Abreu and Mendes evaluated the determinants of bank's interest margins and profitability for some European countries [5]. They find that well capitalized banks face lower expected bankruptcy costs and this benefit interprets into better profitability. Although with a negative mark in all regressions, the unemployment rate is relevant in explanation of bank's profitability.

Ani, Ugwunta, Ezeudu and Ugwuanyi studied determinants of banks profitability in Nigeria by taking a sample of 15 banks for the period of 2001 to 2010 [6]. Using Pooled Ordinary Least Square the results showed that it is not necessary that higher total assets result in higher profitability because of diseconomies of scale. Equity to total assets, debts to total assets and deposits to total assets ratios contributes to profitability. As these ratios increase or decrease profitability will also increase or decrease.

Al-Mutairi and Al-Omar had examined the factors affecting

the profitability of seven national banks in Kuwait for 1993 to 2005 [7]. The results indicated that equity and total assets of a bank are directly related with return on assets (ROA). However, the effect of loan and expenses on profitability is insignificant.

Bourke examined the performance of banks in twelve countries in Europe, North America and Australia during the period 1972-1981 [8]. He found that concentration, liquidity, inflation and size affect the bank performance and profitability positively.

Chirwa determines the relationship between market structure and profitability of commercial banks in Malawi by using time series data during 1970 and 1994 [9]. He finds a long-run relationship between profitability and concentration, capital asset ratio, loan-asset ratio and demand deposits-deposits ratio.

Chatzoglou, Diamantidis and Vraimaki studied banking productivity by taking a sample of 10 banks in Greece [10]. They used standard ratio analysis for measuring the performance of banks. Their results indicated that large size banks perform better than medium and small banks. It means that profitability is positively related with banks size.

Eljelly investigated the determinants of profitability of Islamic banks in Sudan, one of the few countries had total Islamic economic and banking systems [11]. Using a sample of Sudanese banks, the study showed that only the internal factors to these banks have a significant impact on banks' profitability, as measured by return on assets (ROA) and return on equity (ROE).

Ferrouhi conducted a study to analyze the long-term determinants of performance of eight biggest Moroccan commercial banks, for the period 2005-2015, using the Johansen cointegration test [12]. Three measures of performance were used in this study. These were: the net noninterest margin (NIM), returns on assets (ROA), and returns on equity (ROE). The results indicated that the significance of bank specific variables (size of the bank, short-term, long-term and funding liquidity, deposits, and foreign direct investments) are long-term determinants of the performance of Moroccan commercial banks.

Guru et al. studied on a sample of seventeen commercial bank of Malaysia from 1986 to 1995 [13]. This study indicated that the ratio of expense management is one of the most important factors affecting bank's profitability and high interest ratio is related to low bank's profitability.

Haron examined the determinants of profitability in Islamic banks [16]. Researchers have managed to examine and identify various internal factors that have a significant influence on bank's profitability. The study found that internal factors such as liquidity, total expenditures, funds invested in securities, and the percentage of the profit-sharing ratio between the bank and the borrower of funds are highly correlated with the level of total income received by the banks.

Javaid et al. focus in on the internal factors only [17]. This paper uses the pooled Ordinary Least Square (POLS) method to investigate the impact of assets, loans, equity, and deposits on one of the major profitability indicator return on asset

(ROA). The empirical results have found strong evidence that these variables have a strong influence on the significant profitability.

Kosmidou has worked on the determinants of banks' profits in Greece [18]. He took a sample of 23 banks from 1990 to 2002. He collected data from banks financial statements and used regression analysis for the analysis of data. The results showed that equity to assets ratio is positively and significantly related to profitability. Size of bank is also positively and significantly related to profitability.

Lee & Iqbal the results of the random effect-GLS method indicate that total loan to total asset (TLTA), equity to total assets (EQTA), loan to deposit (LTDEP), and interest margin (INTMARGIN) exert a positive effect on both the performance measures (ROA and ROE), while logarithm of total assets (LNASSET), and GDP growth rate (GDPGR) affect the banks' performance negatively [21].

Lartey et al. investigated 9 (nine) listed banks from Ghana aiming at determining the relationship between profitability and liquidity for the year 2005-2010 [22]. They used ratio analysis, time series, correlations and regression analysis to find out the results. From their study, they found that the relationship between profitability and liquidity was positive but insignificant during that period.

Molyneux et al. examined the determinants of bank's interest margins and profitability for some European countries [24]. It is found that well-capitalized banks have lower expected bankruptcy costs and better profitability.

Mahmud et al. the incorporated several bank specific factors in determining the profitability of commercial banks in Bangladesh [23]. The study indicated that capital adequacy ratio, bank size, and total debt to total equity have significant impact on bank performance.

Olson et al., larger bank size, greater dependence upon loans for revenue, and higher proportion of equity capital to asset have generally been associated with greater profitability [25]. Higher liquidity, greater provisions for loan losses and more reliance on debt have been lower indicative of lower bank profits.

Ramlall showed that ratios of equity to assets, loans and liquidity affect ROA positively [27]. Besides, the ratios of deposits to total assets and bad debts affect ROA negatively.

Rahman et al. scrutinized the effect of internal and external indicators on banking productivity by covering a period from 2003 to 2017 with 20 commercial banks working in the realm of Pakistan [28]. It is reported that size does not contribute to Pakistani banks' profitability, and it harms profitability and could be due to diseconomies of scale. Furthermore, it is reported that the capital adequacy ratio plays a significant role in accelerating a bank's profitability, and it positively impacts profitability.

Shair et al. to investigation the Pakistan bank profitability by using the generalized method of moment and taking 26 banks during 2007-2017 [29]. It is concluded that liquidity, capital adequacy, size, taxation, and GDP positively affected banks' profitability, whereas competition and credit risk demonstrate an inverse association with bank performance.

Furthermore, it is reported that operating cost has a positive link with NIM, but negative relation with ROA.

Saad and Zhengge conducted a study to find out the effect of organizational factors such as liquidity, asset utilization, leverage, market share position and firm size on the ROA ROE of financial service firms [30].

Samad to identified a few bank specific factors such as loan-deposit ratio, loan-loss provision to total assets, equity capital to total assets, and operating expenses to total assets and the researcher finds that they significantly impact the performance of commercial banks [31].

Schiniotakis analyzed the factors that affect the profitability of commercial and cooperative banks of Greece [32]. The results showed that profit is greatly influenced by the type of bank and return on assets is positively related with bank capitalization.

Yesmine and Bhuiyah investigated the factors having impact on the financial performance of 10 local private commercial banks (PCB) and 4 nationalized commercial banks (NCB) operating in Bangladesh using secondary data covering the period from 2008-2014 [33]. The data were analyzed under multiple regression model. The study indicated that asset utilization and operating efficiency have significant positive impact on banks' profitability whereas credit risk has significant negative impact with asset utilization being the most critical factor for the PCBs performance.

The above discussion confirms a strong linkage between a bank's profitability and specific factors. The paper addresses the gap in the literature by using challenging financial techniques to testify the bank's profitability in terms of the individual country assessment case like Bangladesh. According to the nature and purpose of each study mentioned in the literature review, a number of explanatory variables have been proposed for key determinants of a bank's profitability. Here taken total assets, investments, expenses, income, etc. to find the relationship with return on assets.

3. Objectives of the Study

The paper's research goal was to examine the influence of numerous factors on the profitability of private commercial banks in Bangladesh.

- 1) To determine the most important financial factors influencing PCB profitability.
- 2) To determine the factors that influences the PCB's profitability.
- 3) To see how important influencing variables on profitability are affected.

4. Data Source and Methodological Framework

4.1. Sampling

This article focuses on evaluating the factors that affect

bank profitability in the private sector in Bangladesh. The Bank Specific Factors are utilized to calculate the bank's profitability in this case. For this study, a total of 16 (sixteen) Private Commercial Banks were considered, with 80 observations from 2016 to 2020. Private commercial banks are chosen using a convenient and judgmental sampling technique. Other variables are chosen based on past scholarly research.

4.2. Sources and Collection of Data

Secondary data were used to explain the paper's purpose because this form of research design is descriptive. The data is gathered from the sample banks' published annual reports.

4.3. Processing & Analyzing Data

Here data were analyzed by using statistical software SPSS 25 version to get a reliable output. A simple model has been used to find out the factors of the profitability of commercial

banks. The model is given below:

$$Y_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Where,

Y_1 = Profitability of the Commercial Banks i.e. Return on assets (ROA).

X_1 = Total cash & cash equivalent to assets (TCA).

X_2 = Total investment to assets (TIA).

X_3 = Total operating expenses to operating income (TOEI).

X_4 = Natural log of total asset (NLBS).

αD = Constant value.

β = Slopes of the independent variables.

ϵ = Represent the error term.

One model was built to determine the specific factors affecting Bangladeshi private commercial banks, and each of them has one dependent variable and four identical, independent variables, as given in table 1.

Table 1. The dependent and independent variables' definitions and notation.

	Variables	Measures	Notation
Dependent variable	Return on assets	Net profit/Total assets	ROA
	Total cash & cash equivalent to assets	Total cash & cash equivalent / Total assets	TCA
Independent variables	Total investment to assets	Total investment/ Total assets	TIA
	Total operation expenses to operating income	Total operation expenses/ Total operating income	TOEI
	Bank Size	Natural log of total assets	NLBS

Note: Specific Factors on Bank Profitability.

5. Hypothesis's of the Study

In order to achieve the research objectives and based on the literature review, the following hypotheses have been proposed for the studies which are:

H1: TCA, TIA, TOEI, and NLBS have an impact on the profitability (ROA) of Private commercial banks in Bangladesh.

6. Data Analysis and Findings

The ultimate goal of this paper is to identify specific factors that affect the profitability of the bank in Bangladesh. As always, there are three aspects to the data analysis. Part

one of the quantitative analysis involves mean & standard deviation. In the second part, the matrix of Pearson correlation and the statistics of collinearity are shown. Multiple regression analyses are shown in the third part. The combination of two or more predictor (independent) variables and one dependent variable is observed through multiple regressions (Krishnaswany) [20].

6.1. Descriptive Statistics

Table 2 demonstrates the results of the descriptive statistics for the regression model's specific factors. As key figures, standard deviation, minimum and maximum values have been registered.

Table 2. Descriptive Statistics.

Variables	N	Minimum	Maximum	Mean	Std. Dev
ROA	80	.01	.05	.0094	.00587
TCA	80	.04	.42	.0794	.04697
TIA	80	.08	1.04	.1504	.10721
TOEI	80	.22	2.95	.6956	.29881
NLBS	80	10.82	13.12	12.52	.33991
Valid N	80				

Source: calculated by the author.

Here the findings say that the standard deviation of ROA is 0.00587. The value is higher than the mean value of 0.0094. As per the table, TCA has a mean and standard deviation of 0.0794 & 0.4697 respectively. TIA showed the mean and

standard deviation for the given data set is 0.1504 & 0.10721. TOEI has experienced a standard deviation equal to 0.29881 and means equal to 0.6956. The mean and standard deviation of BS are 12.5196 & 0.33991 respectively for the

Commercial banks in Bangladesh. Here the outcome says that all these variable shows less deviation from the mean value. That means that are more clustered to the mean value.

6.2. Test of Multi-Collinearity

Table 3. Collinearity Statistics.

Variables	Tolerance	VIF
TCA	.443	2.258
TIA	.479	2.088
TOEI	.930	1.076
NLBS	.661	1.512

a. Dependent Variable: ROA

Source: calculated by the author.

For more reliability of the model, the multi-collinearity test is important. Multi-collinearity is the degree to which one

construct can be explained by the other construct in the analysis (Hair et al.) [15]. A rule of thumb is that the variance-inflating factor (VIF) of a variable exceeds 10, will be considered to be highly collinear (Kleinbaum, Kupper, & Muller) [19].

Here from the tolerance and variation-inflating factor test (VIF) which is shown in table 3, the values of VIF are found to be less than 10. The tolerance level is also satisfactory because the tolerance level does not tend to be zero. It means that multi-collinearity does not exist. So there is no major problem for regression analysis.

6.3. Correlations Analysis

An attempt has been made here to find the link between the various explanatory variables and dependent variables. This correlation is tested at a 5% level of significance.

Table 4. Correlation Analysis.

Variables		ROA	TCA	TIA	TOEI	NLBS
Pearson Correlation	ROA	1.000	.814	.743	.058	-.512
	TCA	.814	1.000	.687	-.056	-.558
	TIA	.743	.687	1.000	.145	-.499
	TOEI	.058	-.056	.145	1.000	-.051
	NLBS	-.512	-.558	-.499	-.051	1.000

Source: calculated by the author.

From the observation of the correlation matrix, it is found that BS has an inverse relationship with ROA. As it can be seen from the table TCA, TLA, and TOEI are positively and significantly associated with ROA. On the opposite of this, there is a negative and significant relationship between BS and ROA.

6.4. Regression Analysis

Here the regression analysis is used through the support of SPSS-25 and the results have been shown by the table:

Table 5. Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the estimate
1	.853 ^a	.728	.714	.00314

a. Predictors: (Constant), NLBS, TOEI, TIA, TCA

Source: calculated by the author.

The summarizing model of regression displays the values of R, R², R²r regulation, and standard errors. Relying on table 7 it can be observed that the value R is 0.853, the value of R² is 0.728 and the adjusted R² value is 0.714. If correct R² is

converted into percentage it can be concluded that 71.4% percent of the changes in bank profitability are explained by independent variables defined in the model.

Table 6. ANOVA^a.

Model	Sum of Squares	df	Mean Square	F	P-Value
Regression	.002	4	.000	50.193	.000 ^b
Residual	.001	75	.000		
Total	.003	79			

a. Dependent Variable: ROA

b. Predictors: (Constant), NLBS, TOEI, TIA, TCA

Source: calculated by the author.

The SPSS output for ANOVA shows that F value is 50.193 and P-value is 0.000 which is less than 5%. This indicates that the overall model is statistically significant.

Table 7. Coefficients^a.

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.006	.017		6.372	.000
TCA	.072	.011	.577	3.777	.000
TIA	.018	.005	.329	.673	.503
TOEI	.001	.001	.042	-.324	.747
NLBS	.000	.001	-.024	.335	.738

Dependent Variable: ROA

Source: calculated by the author.

According to the outcome of table 7, it is clear that statistical values for each independent variable are interpretative here in the model. Based on the following data, the B coefficient is independent variables: the TCA 0.072, 0.018 TIA, TOEI 0.001 and 0.000 BS. This shows that the highest impact on bank profitability based on the amount of B coefficient has: TCA, TIA then two other variables TOEI and BS. In the last column of this table are presented coefficient sig, where the first two variables, the TCA and the TIA coefficient p 0.05 less than per variables: TOEI and BS, confirms that the contribution of these two variables on bank profitability has not a high statistical significance. As a result, the following model predicts the ROA with an explanatory power of about 71.40 percent.

$$Y_1 = .006 + .072_1 X_1 + .018_2 X_2 + .001_3 X_3 + .000_4 X_4 + \mu$$

7. Conclusion

Commercial banks play a key role in the growth of the economy. Banks take deposits from customers and provide loans to various types of businesses, firms, households, individuals, employees etc. The research is carried out to find the factors that affect the profitability of private commercial banks in Bangladesh. The study set consists of 16 private commercial banks in Bangladesh from 2016 to 2020. Four independent variables were taken from literature and theoretical relevance such as Total cash & cash equivalent to assets (TCA), Total investment to assets (TIA), Total operating expenses to operating income (TOEI) and Natural log of the total asset (NLBS) to measure their effect on return on asset.

The study examined the influence of some factors of the selected listed commercial bank on their profitability. The statistical tests regression model revealed some issues such as Total cash & cash equivalent to assets (TCA), Total investment to assets (TIA), Total operating expenses to operating income (TOEI) and Natural log of the total asset (NLBS) to measurement there are significantly related with profitability and hence affect the profitability of commercial banks. From the analysis of t-statistics, p-values and confidence intervals, we can reject the null hypothesis and accept the alternative hypothesis for the variables which means that the sated variables have a significant influence on the profitability of private commercial banks in listed Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE) in Bangladesh.

Future studies can extend the current work by including other independent variables such as internal and external ones, which influence bank profitability, such as interest rates, exchange rates, management of costs, inflation rate, taxation and the rate of GDP indicators. One more extension could be the examination of different factors that affect the profitability of small or large and low or high-profit commercial banks.

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