

# FACTORS INFLUENCING THE PROFITABILITY OF NON-BANK FINANCIAL INSTITUTIONS IN BANGLADESH: A STATISTICAL ANALYSIS

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## Abstract

This study examines the factors specific to firms that affect the profitability of Bangladesh's non-banking financial institutions (NBFIs). The regression is estimated using a model incorporating panel-corrected standard errors by looking at panel data from 22 NBFIs over ten years (2012–2021). The study investigates factors such as the organization's size, capital adequacy ratio, nonperforming loans, liquidity ratio, age, and leverage, focusing on assessing the return on assets (ROA) and equity (ROE). The results present numerous significant insights. First, company size has a significant positive impact on the profitability of NBFIs, indicating that larger institutions frequently outperform smaller ones. Their ability to obtain financing at more affordable rates and investors' perceptions of their dependability may account for this. Second, the study finds a beneficial and substantial association between profitability and the capital adequacy ratio, highlighting the need to maintain higher ratios to improve profitability. Third, the study also reveals that nonperforming loans negatively correlate with profitability, suggesting that NBFIs with reduced credit risk are more successful. Finally, it has been discovered that NBFIs age has a detrimental effect on profitability, especially for older institutions that are still modest in size. Additionally, liquidity has a detrimental impact on profitability, showing that NBFIs make more investments to make money with their available money. However, there needs to be a discernible connection between profitability and leverage. Managers of NBFIs can benefit significantly from the practical implications of these results in knowing the particular elements that influence profitability. These insights can help managers decide about investment strategies, managing nonperforming loans, and capital sufficiency. The present study makes a scholarly contribution by providing panel data on the firm-specific determinants that impact the profitability of NBFIs in Bangladesh, thereby adding to the existing literature.

**Keywords:** NBFIs, ROA, ROE, Firm-Specific Factors, Profitability, Bangladesh

## 1. INTRODUCTION

The progress of a nation is contingent upon the expansion and prosperity of all its economic agents. Therefore, the financial system plays a crucial role in facilitating the transfer of financial resources from areas with excess to those with deficits, thereby enhancing a country's economic prosperity. NBFIs have significantly contributed to the economic areas of Bangladesh by offering additional monetary facilities that conventional banking institutions do not typically provide. This has facilitated the promotion of economic expansion and the fulfillment of clients' changing requirements.

To perform mediation duties, NBFIs are affiliated with commercial banks (Vadde, 2011). NBFIs have a narrower scope of business operations in comparison to commercial banks. By developing products including project financing, credit guarantees, and consulting services, NBFIs play complex roles in the economy (Khandoker, 2013). NBFIs provide unique goods

and services with a manageable product and service portfolio, allowing them to effectively diversify their capital and gain advantages (Gremi & Ballkoci, 2016). Numerous research (Ofoeda, 2017; Gremi & Ballkoci, 2016; and Kumar & Suresh, 2017) have shown that NBFIs are essential to the economic development of industrialized countries. NBFIs have been found to enhance the efficiency of banks, as per the research conducted by Kondova and Bandyopadhyay in 2019. However, banks' profitability is impacted by financial crises, as stated by Dietrich and Andreas in 2011.

According to Bank (2022), 35 NBFIs in Bangladesh are presently involved in non-banking functions. The encouragement of fund mobilization, investment creation, and facilitation of growth in production sectors is facilitated by NBFIs, as noted by Imtiaz et al. (2019). Systematic risks have often been observed in NBFIs, as noted by Ofoeda (2017). Consequently, investors, in general search for finance in areas where investment is proficiently optimized, as highlighted by Lalon and Hussain (2017). The revenues of a financial organization are contingent upon its ability to optimize resources, monitor performance indicators, and manage portfolios effectively (Staikouras & Wood, 2004). According to empirical studies conducted by Ofoeda (2017) and Gremi & Ballkoci (2016), the study revealed that NBFIs' profitability was influenced differently by factors unrelated to banking across diverse global regions. Bangladesh, as an emerging economy, has witnessed significant positive outcomes with the aid of Non-Banking Financial Institutions (NBFIs), as highlighted in studies conducted by Kalam and Utsho (2020), Khandoker, Rahman, and Raul (2013), and Biswas, and Datta (2015). Various extraneous factors can have causes and consequences on the profitability of NBFIs, regardless of their specific banking affiliations. Empirical research has demonstrated that profitability determinants have made Bangladeshi NBFIs' profitability noteworthy. It has been evidenced by studies conducted by Imtiaz et al. (2019), Kalam and Utsho (2020), and Khandoker (2013). In contrast, Imtiaz et al. (2019) reported no statistically significant correlation between non-bank-specific determinants such as loan ratio, firm size, and profitability. Loans, loan ratio to total assets, and operational cost to operating income do not affect profitability, according to Imtiaz et al. (2019). NBFIs, like commercial banks, use mechanistic principles, financial engineering, and specialized labor, although few areas are projected to need strict monitoring. NBFIs are still determining their profitability-determining metrics. Previous research supported such indicators. Bangladeshi NBFIs have some knowledge asymmetry concerning specific profitability determinants. This investigation should identify those significant elements.

This study's primary goal is to examine the impact of company-specific characteristics on the financial success of NBFIs in Bangladesh. The supplemental objectives include examining NBFIs performance indicators and explaining how financial ratios are used to assess profitability.

The NBFIs have gained significant importance in economic development and are complementary to traditional banking services. As a result, they have garnered increased attention from investors curious about their operations and profitability. Recently, stakeholders have placed significant emphasis on assessing the organization's financial efficiency. As a

result, numerous research studies have been undertaken to ascertain the principal indicators of bank profitability. However, several research studies exist on the particular factors that pertain to firms. That impact the profitability of NBFIs based on panel evidence from Bangladesh. This is particularly relevant given the recent advancements and increasing competition within this sector.

Bangladesh's banking industry has experienced a liquidity problem in recent years. Both the banking and non-banking financial institution industries are impacted by this phenomenon, as noted by Kalam and Utsho (2020). This evidence suggests that both industry and firm-specific factors influence non-bank financial institutions (NBFIs). The empirical investigation carried out by Ghareli et al. in 2016 produced diverse outcomes concerning the influence of company-specific characteristics on the caliber of financial disclosure. The scholarly literature has corroborated the influence of firm attributes on financial outcomes, as elucidated by Dioha and colleagues in their 2018 publication. Numerous attributes of firms, including their longevity (Swiss, 2008), magnitude (Malik & Campus, 2011), solvency (Dogan, 2013), and indebtedness (Mukras, 2015), have been observed to exhibit a significant correlation with their level of profitability. In addition, the study conducted by Foyeke et al. in 2015 reveals a significant affirmative correlation between the size of a firm and its financial performance and the degree of corporate governance disclosure. The study was conducted on a group of companies from various sectors in Nigeria, including financial and non-financial sectors. Therefore, due to the complex interaction of the aforementioned factors in influencing performance results, it is imperative to gather further empirical evidence regarding the overall correlation between macroeconomic factors, firm characteristics, and financial performance in emerging markets (Adeoye & Elegunde, 2012). As per the findings of Izedonmi and Abdullahi (2013), it has been established that the influence of macroeconomic determinants varies across diverse sectors.

Ensuring the sustainability of individual NBFIs and the industry is a significant challenge. This situation necessitates an investigation into whether the potential for enhancing the profitability of NBFIs in the forthcoming years is being considered. Additionally, NBFIs engage in a diverse range of profit-generating activities beyond deposit-taking and lending. Engaging in certain activities may result in significant experience hazards. Hence, it is crucial to identify the specific factors of the firm that significantly contribute to its profitability. Enhancing these factors unique to the firm may contribute to achieving long-term sustainability.

After a thorough review of the literature, it was found that there need to be more research gaps between previous studies and the established hypotheses. Various studies have established a correlation between profitability and specific financial metrics: return on equity, total liabilities to shareholders' equity, and term deposits to total assets. Additionally, certain studies have identified the determinant of profitability for banks rather than NBFIs. More evidence was needed to analyze the firm-specific factor capital adequacy ratio, nonperforming loan, liquidity ratio, and leverage to return on asset. The study's objective is to analyze the factors that impact the profitability of NBFIs over an extended period from 2012 to 2021. The study seeks to incorporate additional factors to enhance the analysis.

The study's research question is: How do firm-specific factors—CAR, NPLR, LEV, FS., LIQ, and AGE affect the profitability of NBFIs in Bangladesh?

The current study aims to bridge a void in the available literature by presenting factual data on the profitability of NBFIs in Bangladesh. Various independent variables have been employed in the literature review of prior studies. However, the present study utilizes size, liquidity, capital adequacy, nonperforming loan, and age of the NBFIs as independent variables.

NBFIs endeavor to advance by implementing systematic concepts, financial innovation, and proficient human capital. However, certain domains are anticipated to necessitate meticulous oversight with commercial banks. NBFIs are currently in the process of identifying their distinct indicators that exert significant influence on their profitability. Previous research has yielded significant evidence about the indicators mentioned above. NBFIs in Bangladesh experience information asymmetry regarding the specific factors that impact their profitability to a certain degree. This research endeavor is anticipated to unveil the dominant factors.

## 2. LITERATURE REVIEW

Numerous scholarly investigations have been directed to enhance comprehension of monetary organizations' profitability factors at the organizational level. However, most of the research investigations have been carried out. On commercial banks, with limited research conducted on non-bank financial institutions. This phenomenon could be attributed to the advanced and extensive development of the banking industry.

In their study, Salim et al. (2011) analyzed bank-specific factors, including size, capital adequacy ratio, liquidity, and expenditure management. The research findings suggest that banks' profitability is significantly impacted only by the size of the firms.

According to Hossain's (2012) findings, the leasing business performance of NBFIs suggests a sustainable growth potential for the industry. Therefore, it is recommended that the industry should prioritize activities in the capital market. Due to their elevated cost of funds, non-banking entities are compelled to contend with banking institutions that possess a comparatively lower cost of funds. The author has suggested that this situation may impede the progress and advancement of NBFIs.

The study by Alper and Anbar (2011) aimed to observe the profitability factors affecting the monetary gains of 22 commercial banks, including public and private institutions, operating in Pakistan from 2006 to 2009. Both internal and external factors have been combined with the dependent variables of return on assets and equity. According to the research, rising economic growth is correlated with rising profitability. On the other hand, profitability declines when credit risk increases.

A study was conducted by Abuzar in 2013 to investigate the factors that affect the profitability of Islamic banks operating in Sudan. The study's results suggest that internal factors predominantly impact the profitability of commercial banks. A positive correlation has been observed between bank profitability and cost, liquidity, and bank size variables. The impact of

macroeconomic or external factors on the profitability of a business is not statistically significant.

Vong and Chan's (2006) research endeavor was to investigate the impact of internal and external factors on the banking industry's profitability in Macao for 15 years. The study's results suggest a favorable association between high capitalization and profitability. Furthermore, the research indicates that more critical financial institutions could reap advantages from economies of scale, as demonstrated by their augmented profitability. Conversely, provisioning for loan losses negatively impacts the banking sector's profitability in Macao.

According to the regression analysis of Mehari and Aemiro (2013), the study exposed that size, tangibility, and leverage exhibited a positive and statistically significant relationship with performance in Ethiopian insurance companies. Conversely, the loss ratio (risk) exhibited a statistically significant negative correlation. The study determined that premium growth, age, and liquidity did not exhibit statistical significance in influencing the performance of the insurance companies under investigation.

Sumaira and Amjad (2013) analyzed the factors affecting profitability in Pakistan. 2006-2011, the researchers analyzed data from 31 insurance providers across the life and non-life spectrum. According to the findings, a firm's profitability is significantly influenced by its leverage, size, and age but not by its sales growth or liquidity.

In 2013, Sambasivam and Ayele studied Ethiopian incurrences' performance. The study sample consisted of 9 listed insurance firms from 2003 to 2011. The variables specific to the firm included age, size, capital volume, leverage, liquidity, growth, and asset tangibility. Profitability was assessed using the proxy of ROA. This research exposed that performance substantially impacted growth, leverage, capital volume, size, and liquidity. Although age and tangibility were insignificant, liquidity and leverage exhibited adverse effects.

Andreev and Danilov's (2014) study focused on identifying the elements that affect Malaysian commercial banks' profitability. According to the research's conclusions, a bank's net profits are significantly influenced by a number of variables, including the mix of its assets and deposits, capitalization, expense control, liquidity, bank size, inflation rate, market expansion, interest rate, and regulatory compliance.

The results of Mohanty and Krishnankutty (2018) show that using performance indicators favorably affects the return on assets of Indian banks. For 17 years, from 1999 to 2015, a panel dataset of 39 Indian banks was created. The research found that the size, solvency ratio, loan-to-deposit ratio, expenditure ratio, productivity, CAR, GDP growth, and bank category all substantially impacted ROA.

Sulieman (2014); Adeyanju et al. (2011); Djalilov & Piesse (2016); Arif & Anees (2012) used regression and GMM analysis suggested that the liquidity ratio is highly significant in boosting the financial companies' capacity to generate profit in the Bank of Jordan, Nigeria, and Pakistan.



According to Anwar et al. (2019), the variables of SIZE and LEV reveal a substantial and positive link based on statistical analysis with capital restrictions. It implies that companies in Pakistan with greater size and higher leverage experience more significant financial constraints, resulting in reduced financial accessibility.

According to Arif and Anees' (2012) study, there is a significant relationship between liquidity risk determinants and Pakistani banks' profitability. The correlation between deposit growth and profitability was observed, as it decreased dependence on the Central Bank. The identification of nonperforming loan allocation and a liquidity gap was recognized as factors that caused the Bank's profits to suffer as a direct result of the event. The discoveries mentioned above underscore the significance of proficiently handling liquidity risk and upholding a sound loan portfolio to augment the profitability of financial institutions.

According to Pradhan and Shrestha (2009), Calem and Robb (1999), and Haq and Heaney (2012), there exists a positive correlation between capital deficits and ROA. Numerous scholarly works also explore the correlation between equity and risk. The profit margins enjoyed by various banking organizations are subject to notable influence from liquidity, which is also subject to impact from profitability. The sources cited in the text include Sulieman (2014), Adeyanju et al. (2011), and Arif & Anees (2012). Several academic studies have established a favorable association between a financial institution's magnitude and its profitability level. These studies include works by Alhassan et al. (2016), Abreu and Mendes (2001), Goddard et al. (2004), Chowdhury and George (2015), Sulieman (2014), Menicucci and Paolucci (2016), Anarfi, Daniel, and Emmanuel (2016), and Jabra and Mighri (2017). In contrast, empirical evidence suggests that bank size and deposit have no significant impact on bank profitability, as reported by Anarfi, Daniel, and Emmanuel (2016) and Issn and Ajayi (2016). According to the findings of Demirgüç-Kunt and Huizinga (1999), a positive correlation exists between the inflation rate and banks' profitability. According to Issn and Ajayi's (2016) findings, the size of banks does not significantly impact their profitability. The profitability of banks is positively impacted by the capital adequacy ratio, as evidenced by studies conducted by Dawood (2014), Pradhan and Shrestha (2009), Khatun (2016), and Ozili (2016). The presence of nonperforming loans (NPLs) has been found to harm the profitability of banks, as evidenced by several studies (Nisar, 2015; Opoku et al., 2016; Hanna, 2016; Laryea et al., 2006; Ariyadasa et al., 2017; Djalilov & Piesse, 2016). Additionally, the duration for which a financial institution operates has been in operation is considered an indicator of its ability to provide debt and equity, owing to its established creditworthiness and quality (Niskanen & Niskanen, 2006; Ofoeda & Gariba, 2014; Petersen & Rajan, 1997).

## Hypotheses Development

The following research hypotheses, which were developed based on the empirical literature, were put to the test:

- H<sub>1</sub>: A substantial relationship exists between an NBFIs size and profitability.
- H<sub>2</sub>: A significant association exists between the capital adequacy ratio and the profitability of NBFIs.
- H<sub>3</sub>: There exists a substantial relationship between the NPLR and the NBFIs.
- H<sub>4</sub>: A substantial relationship exists between the leverage and profitability of NBFIs.
- H<sub>5</sub>: A substantial relationship exists between the liquidity and profitability of NBFIs.
- H<sub>6</sub>: There is a significant association between age and profitability of NBFIs.

## 3. METHODOLOGY

This study aims to assess the current empirical literature regarding the correlation between specific variables and the profitability of NBFIs. The investigation centered on the NBFIs of Bangladesh and utilized a statistical approach. This research mainly used the annual reports of NBFIs listed on the Dhaka Stock Exchange (DSE), and the study's data collection period lasted ten years, beginning in 2012 and ending in 2021. During the study period, a subset of 22 NNBFIs was selected for analysis from 34 NBFIs operational in Bangladesh. The selection of NBFIs was based on predetermined criteria, encompassing their market share and functional status during the period under study. It should be noted that certain firms were excluded from the analysis due to factors such as the unavailability of annual or financial reports during the study's execution (<https://www.bb.org.bd/>). The study included eight variables, of which two were classified as dependent variables, namely return on asset (ROA) and return on equity (ROE). At the same time, the remaining six were categorized as explanatory or independent variables. These independent variables were identified as total asset/firm size (F.S.), liquidity ratio (LIQ), Capital Adequacy ratio (CAR), nonperforming loan ratio (NPLR), leverage (LEV), and age of non-bank financial institution (NBFIs). In addition, the study employed the panel corrected standard error regression model.

### 3.1. Model specification

Following is a panel regression model that utilizes the factors that we have selected to test our hypotheses:

$$ROA_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 CAR_{it} + \beta_3 NPLR_{it} + \beta_4 LEV_{it} + \beta_5 LIQ_{it} + \beta_6 AGE_{it} + \epsilon_{it}$$

$$ROE_{it} = \beta_0 + \beta_1 FS_{it} + \beta_2 CAR_{it} + \beta_3 NPLR_{it} + \beta_4 LEV_{it} + \beta_5 LIQ_{it} + \beta_6 AGE_{it} + \epsilon_{it}$$

The term "t" symbolizes time, while "ROA" is a measure used to evaluate the profitability of NBFIs. The Return on Assets (ROA) ratio is calculated by dividing the net income by the organization's total assets. ROE is an abbreviation for Return on Equity. The metric assesses a firm's efficiency in producing earnings per unit of shareholders' equity, also known as net assets

or assets minus liabilities. The variable F.S. represents the size of the company. Calculating the capital adequacy ratio (CAR) involves taking the natural logarithm of a company's total assets. Calculating the metric consists in dividing the aggregate equity by the aggregate assets. The NPLR, an acronym for nonperforming loan ratio, is a metric that indicates a company's capital strength. Calculating the metric involves dividing the total value of nonperforming loans by the aggregate value of loans. A higher ratio signifies an elevated probability of loans transforming into nonperforming assets, which leads to a decline in profitability. LEV denotes the proportion of a corporation's liabilities to its stockholders' equity. The term refers to the debt-to-equity ratio in a company's capital structure, while LIQ denotes liquidity. The study employs the total loans-to-assets ratio as a measure of liquidity, while AGE represents the age of NBFIs. The length of a financial institution's existence facilitates the acquisition of industry experience, elevates its reputation, and fosters customer loyalty. The coefficients that need to be estimated are denoted by  $\beta_0, \beta_1, \dots, \beta_6$ , while  $\epsilon_{it}$  represents the component of error for the company.

In this research, the data set was initially submitted to pre-regression analysis, which included tests for the normality of the residuals and assessments of descriptive statistics, correlation, and correlation coefficients. Next, the data's mean, maximum, minimum, and standard deviation were examined using descriptive statistics—finally, the statistical method of correlation analysis for potential correlation between the relevant variables. Then, “Hausman test” was utilized to test the “fixed effects model” or “random effects model” (Kalam & Utsho, 2020), and the “Panel corrected the standard error (PCSE)” regression model was used to estimate the effect of the problem of heteroscedasticity and autocorrelation (Wooldridge, 2002).

### **3.2. Panel corrected standard error (PCSE) regression model**

The estimated coefficients obtained from fixed effect or random effect models may not yield accurate findings if the acquired data set exhibits heteroscedasticity and autocorrelation problems. In order to obtain more precise estimates, it is imperative to either rectify the dataset or employ a model that can estimate the coefficients after correcting the biases present in the dataset. Given the current circumstances, employing the PCSE regression model is suitable for addressing these issues. It adjusts the standard errors of the coefficient estimates to account for heteroscedasticity and autocorrelation, thus providing more accurate inferences. The PCSE model is specifically designed to account for heteroscedasticity (unequal variance of error terms) and autocorrelation (correlation between error terms) commonly observed in panel datasets. By adjusting the standard errors of the estimated coefficients, the PCSE model provides consistent and efficient estimation, leading to more reliable statistical inference.



#### 4. RESULTS AND DISCUSSION

This section presents the findings and analysis of the study sequentially. Below is the initial descriptive analysis based on the specific factors of the firm.

**Table 4.1: Descriptive Statistics**

Variable	Observation	Mean	Std. Dev.	Min	Max
ROA	201	0.2212438	3.306364	-9.72	3.65
FS	201	23361.78	19213.65	6266	76812.54
CAR	201	0.1392236	0.0826552	-0.0482226	0.309196
NPLR	201	861.2966	908.3194	0	3199.99
LIQ	201	111.8325	89.78816	0	363.3698
AGE	201	21.9204	5.205154	14	34
LEV	201	6.394645	3.712643	-1.878359	13.89356

Summary of descriptive statistics is displayed in Table 4.1. This discussion will analyze the results of various financial performance metrics for NBFIs. The variables under consideration include ROA, F.S., CAR, NPLR, LIQ, AGE, and LEV. Analyzing the average, standard deviation, minimum, and maximum values of NBFIs in Bangladesh can provide insights into their financial stability. The mean ROA value of 0.2212 indicates that, on average, NBFIs generate a return of 22.12% on their total assets. However, the comprehensive standard deviation of 3.3064 suggests a significant variability in the ROA across the observation period. -9.72 and 3.65 are the lowest and highest possible values, indicating negative and positive return periods.

Firm size has a mean of 23361.78 within a range of 6266 to 76812.54 and has a standard deviation of 19213.65. It stated that NBFIs in Bangladesh come in different sizes, even though the average number of assets is relatively lower. The CAR, with a mean of 0.1392, measures the company's ability to absorb losses and maintain adequate capital. The relatively low standard deviation of 0.0827 suggests a stable capital adequacy ratio for NBFIs. The range between the minimum and most significant values of -0.0482 and 0.3092 indicates a cautious capital position. The NPLR measures the proportion of nonperforming loans in the company's portfolio. The mean value of 861.2966 suggests a moderate level of nonperforming loans. However, the significant standard deviation of 908.3194 indicates fluctuations in the NPLR over time. The minimum value of 0 and maximum value of 3199.99 demonstrate potential variations in the company's loan quality. With a mean liquidity value of 111.8325, NBFIs indicate a reasonable level of liquidity. However, the standard deviation of 89.78816 suggests some variability in liquidity. The minimum value is 0, and the maximum is 363.3698, demonstrating potential fluctuations in the company's ability to meet short-term obligations. The average age of 21.9204 indicates that NBFIs have been operating for approximately 22 years. The relatively low standard deviation of 5.2052 suggests a limited variation in the company's age among the observations. The mean leverage value of 6.3946 signifies that NBFIs have a moderate level of debt relative to their equity. The standard deviation 3.7126 suggests some variability in the company's leverage over time. The minimum and maximum values of -1.8784 and 13.8936 indicate potential fluctuations in the company's debt structure.

**Table 4.2: Correlation Analysis**

	ROA	FS	CAR	NPLR	LIQ	AGE	LEV
ROA	1						
FS	0.1455***	1					
CAR	0.4871***	-0.3289***	1				
NPLR	-0.1976***	0.3595***	-0.2639***	1			
LIQ	-0.2806***	-0.006	-0.2365***	-0.0651	1		
AGE	-0.0101	0.4786***	-0.1409***	0.1952***	-0.0573	1	
LEV	0.1756***	0.346***	-0.3603***	0.1043	-0.0236	0.0761	1

\*\*\* correlation is significant at 1%; \*\* correlation is significant at 5%

The findings from Table 4.2 reveal significant relationships between variables and NBFIs' profitability. The correlation coefficients indicate whether the variables are positively or negatively associated with profitability at a certain significance level. The results show that NBFIs' profitability is positively and significantly associated with firm size, capital adequacy ratio, and leverage. It implies that larger NBFIs, those with more substantial capital positions, and those utilizing higher leverage levels tend to have broader profitability. These factors contribute to the potential for increased revenue generation and improved financial performance.

On the other hand, the results also indicate a negative association between NBFIs' profitability and the institutions' nonperforming loan ratio, liquidity, and age. NBFIs with higher nonperforming loans, lower liquidity, and older age may experience lower profitability. Effective risk management practices, a healthy loan portfolio, and sufficient liquidity are crucial for sustaining profitability. Overall, the findings highlight the importance of critical factors in determining NBFIs' profitability. Focusing on factors such as firm size, capital adequacy ratio, leverage, nonperforming loan ratio, liquidity, and age can help NBFIs understand the potential drivers of profitability and guide decision-making processes.

**Table 4.3: VIF test for multicollinearity**

Variable	VIF	1/VIF
FS	1.66	0.602274
CAR	1.37	0.730432
AGE	1.32	0.757745
LEV	1.27	0.788068
NPL	1.21	0.829587
LIQ	1.1	0.908652
Mean	1.32	

The variance inflation factor (VIF) is presented in Table 4.3. This factor measures the degree to which multicollinearity inflates the variance of the predicted regression coefficients. According to Hair et al. (2010), a high VIF value suggests the presence of multicollinearity, with values above 5 or 10 indicating a high degree of multicollinearity. Alternatively, 1/VIF can be used as a measure of tolerance, where a tolerance value below 0.1 indicates a high degree of multicollinearity. Our result of the VIF test for all explanatory variables is less than

5 or a tolerance value greater than 0.1. Therefore, we conclude that our model is free from multicollinearity problems.

**Table 4.5 Diagnostic test**

Diagnostic test statistics		Statistic value	$\chi^2$ (p-value)	Results
Hausman Test	ROA	11.964	0.035	Fixed Effect
	ROE	11.536	0.042	Fixed Effect
Breusch-Pagan-Godfrey	ROA	25.22	0.00	Problem of heteroscedasticity
	ROE	32.93	0.00	Problem of heteroscedasticity
Breusch-Godfrey LM	ROA	45.209	0.064	The problem of serial correlation
	ROE	30.325	0.0000	The problem of serial correlation

Table 4.5 presents the results of various diagnostic statistics used to assess the consistency of the utilized model. The “Hausman test” indicated that the model is a “fixed effect model,” the “Breusch-Pagan-Godfrey” analysis found heteroscedasticity, and the “Breusch-Godfrey LM” test revealed serial correlation. Heteroscedasticity can lead to inefficient and biased coefficient estimates and erroneous statistical inferences. Serial correlation occurs when the error terms of the model at different time points are correlated, suggesting a lack of independence in the residuals.

**Table 4.6 PCSE estimation for ROA**

Variables	Coefficient	St. Error	P-value
FS	0.0000839	0.000018	0.000
CAR	23.417	3.402	0.000
NPLR	-0.000491	0.000282	0.086
LIQ	-0.005	0.002	0.027
AGE	-0.242	0.045	0.000
LEV	0.06775	0.065	0.364
Constant	-4.304	1.44	0.003
R-squared	0.39		
Wald $\chi^2$	73.004		
Prob > $\chi^2$	0.000		

Based on the provided information in Table 4.6, here is an analysis of the coefficients, standard errors, and p-values for the variables in the model, which examines the relationship between ROA and the factors F.S., CAR, NPLR, LIQ, AGE, and LEV. The coefficient of F.S. is 0.0000839. The coefficient's value is highly significant according to the given p-value 0.000. It shows a link between F.S. and ROA that is both statistically significant and positive. The findings indicate a positive correlation between the size of NBFIs and their performance, consistent with the anticipated hypothesis. One possible explanation for this phenomenon is that larger non-bank financial institutions (NBFIs) may have a competitive advantage in accessing capital at a lower cost, which can positively affect their overall profitability. Moreover, customers prefer dealing with larger NBFIs because they perceive them to be more credible. As a result, larger NBFIs can access more funds at a lower cost. It supports the first hypothesis (H1) mentioned. These findings are consistent with previous studies conducted by Alhassan et al. (2016) and Goddard et al. (2004).

The coefficient for CAR is 23.417, with a standard error of 3.402. The reported p-value of 0.000 indicates the statistical significance of the coefficient. It suggests that CAR has a positive and significant relationship with ROA. The statement suggests that financial institutions with more significant capital reserves have a higher ability to absorb losses, ultimately leading to increased profitability. In other words, NBFIs with higher CAR are more profitable. It could be because NBFIs with higher CAR are perceived as more reliable by investors, as they operate under a more rigid regulatory system. This perception is particularly relevant in the context of Bangladesh, where customers have experienced significant losses due to the bankruptcy of such institutions, as well as instances of officials misappropriating customer funds. Therefore, the second hypothesis (H<sub>2</sub>) mentioned is supported. These findings align with previous studies conducted by Dawood (2014), Pradhan & Shrestha (2009), and Khatun (2016), which indicate that a higher CAR has an optimistic influence on the profitability of financial institutions.

The NPLR coefficient is -0.000491, with a standard error of 0.000282. The p-value is 0.086, which exceeds 0.05. Thus, the coefficient for NPLR is not statistically significant at the 0.05 level, suggesting no meaningful association between NPLR and ROA. The remark implies that financial organizations profit from fewer nonperforming loans. It shows that decreasing nonperforming loans increases NBFIs profitability. NBFIs with reduced credit risk perform better. NBFIs operate in the informal economy, which has fewer loan defaults. NBFIs provide comparatively higher interest rates to compensate for their lower risk profile. Despite lesser credit risk, this higher interest rate helps them stay profitable. Thus, credit risk lets NBFIs charge higher interest rates, which boosts their profits. H<sub>3</sub> is supported. Opoku (2016)'s prior studies found that nonperforming loans hurt bank profitability.

The regression analysis reveals that the coefficient value for LIQ is -0.005, and its corresponding standard error is 0.002. The statistical significance level of the reported p-value is 0.027, indicating a significance level below the commonly accepted threshold of 0.05. Hence, the statistical significance of the coefficient of LIQ indicates a negative correlation between LIQ and ROA. NBFIs in Bangladesh efficiently allocate their funds towards money and capital investments, primarily portfolio-centric. As a result, the fourth hypothesis (H<sub>4</sub>) is supported, indicating that lower liquidity is associated with higher profitability for NBFIs. Notably, the correlation between liquidity and profitability may fluctuate based on the particular circumstances and strategies employed by financial institutions. Generally, higher liquidity provides a buffer against potential risks and allows banks to meet short-term obligations more efficiently.

On the other hand, lower liquidity indicates a higher level of investment or lending activities, which can generate higher returns and profitability. The result is consistent with the finding of some previous studies (Adeyanju et al., 2011; Arif & Anees, 2012; and Sulieman, 2014). They suggest that a company's higher liquidity makes a bank more profitable. In contrast, higher liquidity indicates a lower performance of the financial institution, and it causes lower overall performance of the financial institutions (Alhassan et al., 2016). The regression analysis reveals that the coefficient for the variable AGE is -0.242, and its corresponding standard error is 0.045. The statistical significance of the coefficient is confirmed by the reported p-value of 0.000. The

results suggest a significant negative link between the AGE and the ROA. The results suggest that the performance of NBFIs tends to decline as they mature and expand in size. This statement contradicts the anticipated growth trend and consequent performance improvement for mature non-bank financial institutions. The negative effect on performance occurs when older NBFIs remain more diminutive. Older firms are expected to increase in size compared to smaller ones generally. The negative correlation between the expansion of NBFIs and their competitive environment may be attributed to the formidable competition posed by commercial banks and other financial institutions. Furthermore, the emphasis on the informal sector of the economy, characterized by limited financial resources, can impact their operations' scale and overall efficacy. These results contradict the findings of previous studies by Petersen and Rajan (1997) and Niskanen and Niskanen (2006), which suggest that the length of time a financial institution has been in business reflects its reliability as a source of debt and equity. On the other hand, the statement contradicts the findings of Ofoeda and Gariba (2014), who suggest that the length of time a financial institution has been in business indicates its reliability and quality as a source of debt and equity.

The coefficient value of LEV is 0.06775, accompanied by a standard error of 0.065. The statistical analysis yields a p-value of 0.364, indicating a lack of statistical significance as it exceeds the predetermined alpha level of 0.05. Consequently, the statistical insignificance of the coefficient for LEV at the 0.05 level suggests a significant correlation between LEV and ROA may not exist. Furthermore, the R-squared value, which is reported as 0.39, is used to evaluate the model's overall fit. It implies that the model incorporates independent variables that can account for around 39% of the variability observed in the dependent variable, ROA. Finally, the Wald chi-square test is utilized to evaluate the global significance of the model. The Wald chi-square value reported is 73.004, with a corresponding p-value of 0.000. It suggests that the model is statistically significant in its entirety. Based on the provided coefficients, standard errors, and p-values, FS, CAR, LIQ, and AGE are statistically significant predictors of ROA. NPLR and LEV, on the other hand, do not appear to have statistically significant relationships with ROA in this model. The model itself shows a moderate fit with an R-squared value of 0.39, and the Wald chi-square test confirms the overall statistical significance of the model.

**Table 4.7 PCSE estimation for ROE**

Variables	Coefficient	St. Error	P-value
FS	0.000354	0.000111	0.002
CAR	86.179	16.401	0.000
NPLR	-0.003	0.001	0.080
LIQ	-0.046	0.016	0.005
AGE	-0.37	0.194	0.059
LEV	0.291	0.367	0.418
Constant	-8.579	8.68	0.323
R-squared	0.290		
Wald $\chi^2$	70.308		
Prob > $\chi^2$	0.000		



Table 4.7 displays the results of a study of coefficients, standard errors, and p-values to determine whether or not F.S. is significantly related to the dependent variable, Return on Equity (ROE). With a standard error of 0.000111, the F.S. coefficient was calculated to be 0.000354. The coefficient is statistically significant, as indicated by the p-value of 0.002. This statistically significant coefficient lends credence to the notion that F.S. is positively associated with ROE, supporting the hypothesis ( $H_1$ ). In particular, the ROE of an entity tends to rise in tandem with its F.S. This indicates that greater ROE (a measure of profitability) corresponds to more excellent financial stability. These results have substantial ramifications for elucidating the mechanisms behind the entity's profitability. These results also agree with those from prior research by Alhassan et al. (2016) and Goddard et al. (2004). Consistent with their previous work, the positive correlation between F.S. and ROE lends credence to the hypothesis that more financially secure organizations are more likely to create superior returns for their shareholders.

The reported p-value of 0.000 indicates that the regression coefficient is most highly significant. It shows a statistically significant positive correlation between the CAR and the ROE. The results above are consistent with prior research conducted by Dawood (2014), Pradhan & Shrestha (2009), and Khatun (2016), which suggest that the implementation of a CAR has a favorable effect on the financial performance of banks.

The NPLR coefficient is -0.003. The reported p-value of 0.080 exceeds the conventional significance level of 0.05. Consequently, the statistical insignificance of the coefficient for the NPLR at the 0.05 level suggests that a significant correlation between this variable and ROE may not exist. The coefficient of the LIQ variable is -0.046, with a standard error of 0.016. The statistical significance of the coefficient is confirmed by the reported p-value of 0.005. It indicates a statistically significant inverse correlation between the NPLR and the return on equity (ROE). The obtained outcome is in line with the discoveries of several earlier investigations, namely Adeyanju et al. (2011), Arif and Anees (2012), and Sulieman (2014). The proposition posits that the increased liquidity of firm results in enhanced profitability for a financial institution. According to Alhassan et al. (2016), financial institutions with higher levels of liquidity tend to exhibit lower performance levels, resulting in an overall decrease in performance.

The regression analysis indicates that the coefficient for the AGE variable is -0.37, with a standard error of 0.194. The reported p-value is 0.059, marginally exceeding the significance level of 0.05. Consequently, the coefficient about AGE lacks statistical significance at the 0.05 level. It suggests that a significant association between AGE and ROE may not exist. The coefficient of the LEV is 0.291, with a standard error of 0.367. The statistical analysis indicates a p-value of 0.418, which exceeds the significance level of 0.05. Consequently, the statistical insignificance of the coefficient for the LEV at the 0.05 level suggests that there may be no significant correlation between this variable and ROE.

Furthermore, the R-squared metric evaluates the model's general adequacy, which is documented as 0.290. It suggests that around 29% of the variance observed in the dependent variable, namely ROE, can be accounted for by the independent variables incorporated in the model. Finally, the Wald chi-square test is utilized to evaluate the overall significance of the

model. The Wald chi-square value reported is 70.308, with a corresponding p-value of 0.000. It suggests that the model is statistically significant in its entirety.

Based on the provided coefficients, standard errors, and p-values, the FS and CAR are statistically significant predictors of ROE. The LIQ variable also appears to be statistically significant. The remaining independent variables do not show statistically significant relationships with ROE in this model. The model itself shows a moderate fit with an R-squared value of 0.290, and the Wald chi-square test confirms the overall statistical significance of the model.

## 5. CONCLUSION AND RECOMMENDATIONS

This study aimed to assess the organization's specific factors that influence the profitability of NBFIs in Bangladesh. The research employed a “panel corrected standard error regression model” and gathered information from the published annual reports of 22 NBFIs that are listed on the DSE. The data was collected between 2012 and 2021, covering a decade-long period. The focus of the study was on eight variables, consisting of two dependent variables, specifically return on assets (ROA) and return on equity (ROE), and six explanatory or independent variables, namely firm size (FS.), liquidity ratio (LIQ), capital adequacy ratio (CAR), nonperforming loan ratio (NPLR), leverage (LEV), and age of NBFIs. The analysis aimed to investigate the correlations between the variables above and the profitability of NBFIs in Bangladesh.

The coefficients, standard errors, and p-values analysis reveal several significant findings regarding the correlation between the dependent ROA and the independent variables FS., CAR, NPLR, LIQ, AGE, and LEV. The findings suggest that FS., CAR, LIQ, and AGE exhibit statistically significant associations with ROA and ROE. However, NPLR and LEV are not significant predictors. The model exhibits a moderate fit, evidenced by an R-squared value of 0.39. Additionally, the Wald chi-square test confirms the model's overall statistical significance.

The coefficient for F.S. suggests a positive and significant relationship with ROA, indicating that larger non-bank financial institutions (NBFIs) tend to perform better than smaller ones. It aligns with prior expectations and may be attributed to larger NBFIs' ability to raise capital at lower costs and their perceived credibility among customers, resulting in greater access to funds and improved profitability. The coefficient for CAR indicates a positive and significant relationship with ROA and ROE, implying that NBFIs with higher capital adequacy ratios tend to be more profitable. This association can be attributed to the perception of higher credibility among investors, as institutions with more significant capital reserves have a higher ability to absorb losses. The coefficient for NPLR does not exhibit statistical significance, suggesting that the relationship between nonperforming loans and ROA may not be significant. However, the statement indicates a negative relationship, implying that smaller nonperforming loans contribute to increased profitability. This finding aligns with the notion that NBFIs operating in the informal sector, with lower credit risk, charge higher interest rates to compensate, thereby maintaining high profitability despite the lower credit risk.

The coefficient for LIQ demonstrates a statistically significant negative relationship with ROA and ROE, indicating that lower liquidity is associated with higher profitability for NBFIs. It aligns with the notion that effective utilization of funds for money and capital investments, which tend to be more portfolio-oriented, leads to increased profitability. The coefficient for AGE exhibits a statistically significant negative relationship with ROA, suggesting that as NBFIs age, their performance decreases. This finding contradicts the expectation that older NBFIs would increase in size and enhance their performance, possibly due to stiff competition and limited funds in the informal sector. Finally, the coefficient for LEV does not demonstrate statistical significance, indicating that the relationship between leverage and ROA may not be significant in this model. Additionally, the model's R-squared value of 0.39 indicates that the included independent variables can explain approximately 39% of the variation in ROA.

Based on the findings, it is recommended that non-bank financial institutions (NBFIs) focus on improving their capital adequacy ratios (CAR) and effectively utilizing their funds for money and capital investments (LIQ) to enhance their profitability. Additionally, attention should be given to the size (FS) and age (AGE) of NBFIs, as these variables exhibit significant relationships with ROA. Strategies that enable NBFIs to raise capital at lower costs, enhance their credibility, and adapt to competition and limited funds in the informal sector can contribute to improved performance. Further research is encouraged to explore the non-significant relationships of NPLR and LEV with ROA and ROE and investigate additional factors that may influence the profitability of NBFIs.

#### **Conflict of Interest**

There are no conflicts of interest for the author of this paper.

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