Assessing the Relationship between Price-Earnings (P/E) Ratio and the Financial Viability of Commercial Banks: Empirical Evidence from Bangladesh

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ABSTRACT

This study investigates the relationship between commercial banks' financial health and the price-earnings (P/E) ratio. Secondary data from 30 commercial banks in Bangladesh was gathered and analyzed over ten years, spanning 2014 to 2023, for this study. A descriptive research design was employed to do this. The data was collected from the selected institutions' annual reports and financial statements. Panel data regression model, more especially the Fixed Effects Regression with Clustered Standard Errors, was used in this study's data analysis to mitigate autocorrelation and provide consistent and efficient estimates, thereby enhancing the overall validity of the results. The study's findings reveal that while the P/E ratio shows a significant relation with the financial performance of banks, certain variables, such as liquidity ratio, leverage ratio, and net interest margin, do not demonstrate a meaningful impact. Additionally, the analysis emphasizes the negative consequences of the COVID-19 epidemic on the banking industry, such as a rise in financial irregularities and a decline in investor confidence, which probably helps make some of the independent variables insignificant. This research offers valuable insight into the financial viability of commercial banks in Bangladesh and suggests that the P/E ratio, while helpful, must be considered alongside other macroeconomic and institutional factors. However, this study highlights the importance of using multiple financial indicators for informed investment decisions and aids banking professionals in evaluating the long-term financial health of banks.

Keywords: Panel Data, Financial Performance, Bangladesh's Commercial Banks, P/E Ratio, Fixed Effects Regression.

JEL Classification- C33, G12, G21, G32.

INTRODUCTION

The banking industry is vital to Bangladesh's economic growth by supporting market stability, financial intermediation, and sustainable development. Over the past decade, this sector has undergone significant changes due to globalization, regulatory updates, technological progress, and shifting consumer demands. Banks act as financial intermediaries, linking those with excess funds to those needing financing. This process ensures effective resource allocation, which is crucial for emerging economies like Bangladesh. However, the banking sector faces challenges from its unpredictable nature and global economic uncertainties. These factors make it essential to understand the key elements that affect the performance and value of banks. One of the most commonly used measures to assess a company's market value is the Price-Earnings (P/E) ratio. This ratio indicates how much investors will pay for each unit of a company's earnings. It reflects the market's perception of a company's growth potential and profitability. For investors, analysts, and policymakers, the P/E ratio is critical for evaluating a company's prospects. In the banking industry, it is used to assess market confidence, financial stability, and the investment appeal of publicly traded banks. Despite its global importance, there is limited research on the factors influencing the P/E ratios of banks in Bangladesh.

To bridge this research gap, this study assesses the relationship between the P/E ratio and key financial performance indicators of 30 commercial banks in Bangladesh over ten years from 2014 to 2023. The study

focuses on the impact of key financial metrics such as LQR, LR, NPM, NIM, NPL ratio, and ROE on the P/E ratio. These indicators have been selected because they are crucial in evaluating a bank's market performance, financial health, and operational efficiency. The analysis of these financial metrics provides valuable insights into how they affect investor confidence and influence the market valuation of banks. The selected time frame is significant as it covers a period of essential developments in Bangladesh's banking sector. During these years, banks encountered various challenges, such as changes in liquidity conditions, a rise in non-performing loans, and adjustments in regulatory policies. Technological advancements and increased competition from non-banking financial institutions prompted banks to innovate and adapt to the evolving market landscape. Given these shifts, examining the link between financial performance indicators and valuation measures like the P/E ratio in Bangladesh's changing financial environment is essential. However, Policymakers can leverage the findings of this research to design regulatory frameworks that promote transparency, efficiency, and stability in the banking sector. This research will contribute to bridging the gap in the literature on the valuation mechanisms of commercial banks in an emerging economy and offer actionable recommendations for investors, analysts, and policymakers.

Objectives of the Research

This study's main goals are:

1. To investigate the relation between banks' financial performance indicators and P/E ratios.
2. To evaluate whether the P/E ratio serves as an effective indicator of market sentiment and valuation accuracy.

Research Problem

Even though the P/E ratio is frequently used as a valuation measure, its application within Bangladesh's banking sector remains inadequately explored. The challenge lies in understanding whether financial performance indicators sufficiently explain variations in P/E ratios amidst economic volatility and sector-specific challenges. Addressing this research gap is crucial for enhancing the accuracy of stock valuation and ensuring investor confidence in an emerging economy like Bangladesh.

Research Outline

The paper is organized into several sections. The introduction provides background and objectives, followed by a section on research data and methodology detailing data sources and analysis techniques. The model estimation section outlines the regression approach used for analysis. The analysis and discussion section interprets the results, followed by the findings. Finally, the conclusion summarizes the study's key insights and offers recommendations.

LITERATURE REVIEW

Empirical Review

Various studies have previously explored how financial performance indicators influence the P/E ratio in the banking area, with some similarities and differences. However, conflicting results also exist, and resolving this relationship is crucial for developing countries with uncertain economic environments.

Several empirical studies have explored the factors influencing the Price-Earnings (P/E) ratio, considering sector, year, and firm size variables. Anderson and Brooks (2006) analyzed data from all UK firms between 1975 and 2003, concluding that, in addition to firm-specific factors, three significant elements affect P/E ratios: firm size, the year of calculation, and industry effect. Alford (1992) also highlighted the significance of industry selection in explaining variations in P/E ratios. Again, Cho (1994) conducted a study on 1,203 US firms, investigating the impact of firm size and industry on P/E ratios while controlling for other variables by grouping firms into five industries based on their business type. Business size and the P/E ratio were found to be negatively correlated by regression analysis, with the mining industry accounting for the majority of the variances in the P/E ratio. Besides, Kumar and Warne (2009) examined emerging stock markets annually and

sector-wise using data from 243 companies registered on the Bombay Stock Exchange between 2001 and 2007.

Dividend yield and the P/E ratio were found to be negatively correlated by Taliento (2013). Ahmed (2003) also found that dividend yield was a major determinant of share prices in Nepali commercial banks, with a substantial inverse link between dividend yield and share price. However, Jitmaneeroj (2017) found that the price-to-earnings ratio and dividend yield were positively correlated in his research. Emudainohwo (2017) looked at the relationship between dividend growth rate and P/E ratio and found that the data was insufficient to explain changes in the P/E ratio for non-financial companies listed on the NSE over the course of the study. The data was insufficient to account for P/E ratio fluctuations, even if it showed a negative link between dividend growth rate and P/E ratio. In his study on the relationship between financial earnings and stock prices, Kothari (2001) highlighted the P/E ratio as a crucial statistic that represents investor sentiment through market price as well as financial data like earnings. Like Lovell (1993), he cautioned that depending solely on a low-P/E portfolio would yield less-than-ideal returns. In contrast, Ahmed (2003) discovered no meaningful connection between the P/E ratio and stock performance.

However, Wu (2014) found that the link between return on equity (ROE) and the P/E ratio is U-shaped, meaning that businesses with higher P/E ratios generally have lower ROE. Ohlson and Gao (2006) similarly anticipated a U-shaped link between ROE and the P/E ratio. Huang (2008) showed that ROE has a direct effect on P/E ratios, and it is adversely correlated with the P/E ratio. As per Fairfield (1994), the Price-to-Book (P/B) ratio indicates anticipated future profitability, while the P/E ratio displays anticipated future changes in profitability. Her theory states that the P/E ratio and future return on book value should positively correlate with profit growth and future return on book value, respectively. This hypothesis is supported by data demonstrating that distinct P/E-P/B ratios are associated with distinct trends in future profitability. On the other hand, Lalon and Mahmud (2021) found that the P/E ratio is significantly influenced by the non-performing loan (NPL) ratio, asset utilization ratio, net profit margin ratio, and net interest margin (NIM) ratio, among other performance indicators of private commercial banks in Bangladesh. Moreover, Sunaryo (2022) assert that EPS does not operate as a mediator between the effects of the debt-to-equity ratio, current ratio, and net profit margin on the P/E ratio. Another study by Sari et al. (2021) discovered that the current ratio has an impact on the P/E ratio. However, Rabbani et al. (2018) found no influence of the current ratio on the P/E ratio.

A number of empirical studies have examined the industry, year, and business size as determinants of the Price-Earnings (P/E) ratio. In addition to firm-specific considerations, Anderson and Brooks (2006) found that P/E ratios are influenced by three primary factors: firm size, the year of computation, and the industry effect. They analyzed data from all UK enterprises between 1975 and 2003. Alford (1992) also emphasized how important industry selection is in elucidating P/E ratio fluctuations. Cho (1994) divided companies into five industries according to their business types in order to adjust for other factors and investigate the effects of company size and industry on P/E ratios in a study of 1,203 US enterprises. According to the results of the regression, company size showed a negative correlation with the P/E ratio, whereas the mining industry had the biggest influence on the variations in the ratio. Kumar and Warne (2009) used data from 243 businesses listed on the Bombay Stock Exchange between 2001 and 2007 to do an annual and sector-specific examination of emerging equity markets. According to their regression research, the two main determinants affecting P/E ratios in the Indian capital market were business size and market price volatility.

UK firm samples have the advantage of being more numerous than their US counterparts, according to Michaely and Roberts (2012). They also note that the economic conditions of the US and the UK are very similar. This observation was crucial for this research, as it was aimed to determine whether the factors influencing discount rates in the UK would align with those in the US. Any discrepancies between the two would suggest differing risk profiles for investors in these countries. Another significant study for this research is Cochrane's (2011) survey paper, which primarily summarizes developments in the discount rate literature. The study traces the evolution of dividend yield regressions and their interpretation in expected stock returns, moves through Beta models developed over fifty years ago, with the Capital Asset Pricing Model (CAPM) being the focal point initially, and later explores multifactor models that introduced numerous factors into asset pricing literature. Cochrane's study is especially relevant to our work for two main reasons. First, it

emphasizes that discount rates are the best proxy for asset pricing; regardless of the asset choice, stocks, bonds, or the overall value of companies, they most effectively capture the variations in asset values over time.

A similar concept to Cochrane's (2011) work was discussed in Constantinides's (2002) earlier survey, where he emphasized that covariance should be the main point of future asset pricing research. This idea shaped the direction of this thesis, which aimed to consolidate key factors highlighted in the literature and assess their contribution to the formulation of discount rates in private company valuation. The primary goal of this research was to develop a theoretical framework that approximates the value of a private company as efficiently as possible. In addition, it looked into how private and public companies were related, with a particular emphasis on which public companies provided the best stand-ins for private companies throughout the valuation process. Established research by Gerakos et al. (2013), which employed NASDAQ and AIM companies as benchmarks because of their resemblance to unlisted enterprises, served as the foundation for the selection of public comparable firms.

Nonetheless, the subject of private firm valuation and discount rate theory has evolved as a result of recent works by Brav (2009), Cooper and Priestley (2016), Hope et al. (2013), Abudy et al. (2016), Asker et al. (2015), and Sheen (2020). Furthermore, Zarowin (1990) examined 80 companies using an ex-ante forecast of earnings growth and found that their P/E ratios, but not risk or prior growth, were strongly connected with anticipated long-term growth. According to Allen and Cho (1999), expected growth was a major predictor of P/E ratios, while risk and prior growth were not. However, according to Alford (1992), neither historical nor anticipated growth could sufficiently account for P/E ratios. The sole significant explanatory variable for P/E volatility was of Kane et al. (1996), who used the ARCH model to predict the volatility of the P/E ratio for the S&P 500 index.

Despite the many exceptions noted by Weil (2001), many security analysts follow the general rule that a lower P/E ratio denotes a more inexpensive firm. Numerous oddities have been discovered through research in developed equities markets. Even after controlling for risk, Basu (1977) found that low P/E stocks perform higher than their high-P/E counterparts. In a subsequent analysis, Basu (1983) showed that, even after accounting for business size, low-P/E stocks yield superior risk-adjusted returns. These results paved the way for more research by Fama and French (1992) and Cook and Rozeff (1984). Although a well-diversified portfolio is advantageous, Lovell (1993) warned investors against rigorously adhering to a low-P/E strategy from a strategic perspective, stating that doing so could result in less-than-ideal diversification. P/E ratios in emerging equity markets (EEMs) have not yet been the subject of any investment-related studies. An exploratory investigation into the statistical characteristics of P/E ratios in the Zimbabwean stock market was carried out by Oppong (1993). By adopting a global viewpoint, Nikbakht and Polat (1998) significantly advanced the literature on risk and equity valuation in EEM by suggesting that risk, as indicated by the earnings standard deviation, and expected earnings growth are key factors influencing P/E ratios for multinational corporations.

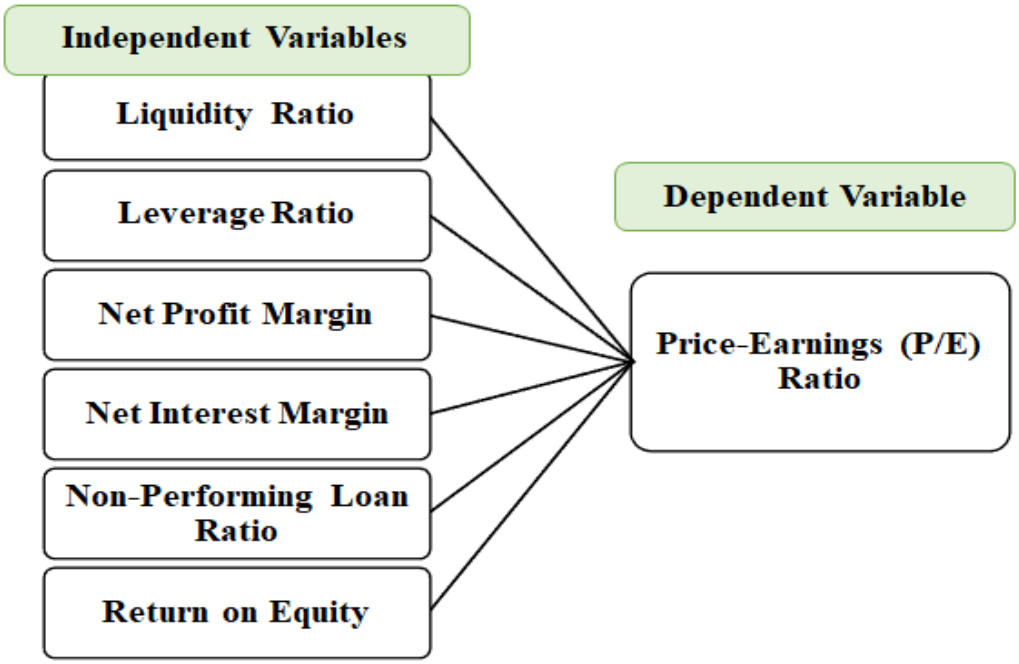
A valuation model that links growth, risk, and accounting practices to the reciprocal of the P/E ratio (E/P ratio) was created by Delen et al. (2013). Predicting positive correlations between accounting practices and P/E ratios (and negative correlations with E/P ratios), they suggested that companies with more conservatively reported earnings would have higher P/E ratios. They ran several iterations of a regression model and three accounting factors in addition to financial variables in order to evaluate this hypothesis. Their initial model included all three accounting methods as explanatory factors. Building on this framework, Zarowin (1990) re-examined the findings of earlier studies using a cross-sectional model derived from Rakhi's (2014) approach. Zarowin (1990) made the assumption for his analysis that the market predicts firms' EPS growth over the short (one-year) and long (multi-year) periods. In order to conform to previous studies, he incorporated both growth rates independently into the model. Zarowin ranked companies according to their P/E ratios and constructed 15 equal-sized portfolios to examine the persistence of P/E ratios. By examining correlations over time, he found a persistent relationship between firm fundamentals and P/E ratios.

Research Gap

In the banking industry, there is still disagreement over the relationship between financial performance metrics

and the price-to-earnings (P/E) ratio. While prior studies like Kothari (2001) suggested that stock prices reflect earnings information, Kumar and Warne (2009) highlighted company size and stock price variability as key determinants of the P/E ratio. However, sector-specific characteristics, as noted by Anderson and Brooks (2006), add complexity to this relationship. By analyzing the effect of financial performance metrics on the P/E ratio of Bangladeshi commercial banks, this study fills the knowledge gap using a fixed-effects regression model with clustered standard errors, thus offering robust insights into bank-specific valuation dynamics.

Conceptual Framework for the Research



Hypothesis Statement

The Fixed-Effect Regression model with clustered standard errors is evaluated using the following assumptions to ascertain the association between the price-earnings (P/E) ratio and bank performance. Specific data and assumptions are proposed for this study, though these are preliminary and require testing to verify their accuracy. To achieve this, the following hypotheses are established to facilitate the analysis of collective data using statistical methods.

Hypotheses	Description
$H_0 1$	Liquidity ratio (LQR) has no significant impact on P/E ratio.
$H_0 2$	Leverage ratio (LR) has no significant impact on P/E ratio.
$H_0 3$	Net Profit Margin (NPM) has no significant impact on P/E ratio.
$H_0 4$	Net Interest Margin (NIM) has no significant impact on P/E ratio.
$H_0 5$	Non-Performing Loan Ratio (NPL) has no significant impact on P/E ratio.
$H_0 6$	Return on Equity (ROE) has no significant impact on P/E ratio.

METHODOLOGY

This study uses a quantitative research design to focus on the descriptive research approach. It examined the connection between the price-earnings (P/E) ratio and the strength of commercial banks' finances using Fixed-

Effect Regression model with a clustered standard error. Due to serial correlation problems, this is an adaptation of the Fixed-Effect Regression with clustered standard error approach.

Sources of Data

The study focuses on Bangladesh's banking sector, with a sample comprising 30 commercial banks that provided financial services over 10 years from 2014 to 2023. This research relies on secondary data from these bank's audited financial statements and annual reports, which remained operational throughout the study period. Here, the secondary quantitative data has been used in this research collected from the commercial bank's published financial reports (the balance sheets and income statements). Related data have also been gathered from commercial banks' websites to ensure the data represents the analysis. Other written materials are also looked at as documents, books, journals, newspapers, and web pages.

Measurement of Variables

a) Price-to-Earnings (P/E) Ratio (Dependent Variable): The P/E ratio provides information about investor sentiment and growth expectations by evaluating how the market values a bank's share price to its profits per share (EPS).

$$\text{P/E Ratio} = \frac{Market\ Price\ per\ Share}{Earning\ per\ Share\ (EPS)}$$

b) Liquidity Ratio is a financial metric that assesses how well a business can meet its short-term obligations with its most liquid assets. It makes evaluating the company's financial stability and solvency easier in the short term. It is frequently calculated using the liquid asset-to-total asset ratio.

$$\text{Liquidity Ratio} = \frac{Liquid\ Asset}{Total\ Asset}$$

c) Leverage Ratio represents the proportion of a bank's debt relative to its equity, highlighting its financial risk.

$$\text{Leverage Ratio} = \frac{Total\ Debt}{Total\ Equity}$$

d) The Net Profit Margin represents the proportion of total revenue that remains as profit after subtracting all expenses. It gauges a bank's profitability and operational effectiveness. A higher net profit margin indicates efficient cost control and increased profitability. This metric is one of the key indicators' investors use to evaluate a bank's financial performance.

$$\text{NPM} = \frac{Net\ Profit\ After\ Tax}{Total\ Revenue} \times 100$$

e) Net Interest Margin (NIM) indicates the profitability of the bank's primary lending and borrowing business model. Compared to the bank's total assets, it calculates the difference between interest revenue from loans and interest costs on deposits. A higher NIM indicates more efficient profit production from interest-earning activities. Banks with a high NIM are often seen as having better interest rate risk management capabilities and more successful.

$$\text{NIM} = \frac{Net\ Interest}{Average\ Earning\ Asset} \times 100$$

f) Non-Performing Loan (NPL) Ratio evaluates the proportion of non-performing loans in the bank's overall loan portfolio. Non-performing loans are those that have been overdue or defaulted, generally for 90 days or longer. This ratio reflects the bank's credit risk and asset quality. A high NPL ratio indicates poor credit quality, while a low NPL ratio suggests stronger loan performance.

$$\text{NPL} = \frac{Non\text{-}performing\ Loan}{Total\ Loans} \times 100$$

g) Return on Equity (ROE) reflects the bank's profitability and how efficiently it uses shareholders' funds. A higher ROE indicates stronger financial performance and better capital utilization. ROE is calculated using the following equation.

$$\text{ROE} = \frac{Net\ Income\ After\ Tax}{Shareholder's\ Equity}$$

Research Design

This research follows a quantitative design, providing a structured method for gathering, measuring, and analyzing data to test the hypotheses. A descriptive approach is employed to explore the relationship and connection between predefined variables thorough analysis. As a result, the study uses quantitative data, typically expressed in numerical terms, such as test scores. This study's dependent variable is the Price-Earnings (P/E) Ratio. At the same time, the independent factors are the Liquidity Ratio, Leverage Ratio, Net Profit Margin, Net Interest Margin, Non-Performing Loan Ratio, and Return on Equity.

Panel data estimation technique has been used because it helps to handle differences among individual banks by considering specific variables for each bank. By combining data from multiple periods and different banks, more valuable information can be acquired, less redundancy among variables, more flexibility in data analysis, and better results can be achieved. Panel data also reduces the bias that could arise if the banks are looked at as a group. It enriches analysis in a way that wouldn't be possible if only data from a single period were used or from individual banks separately. To evaluate the collected data, STATA version 15 software was used.

Model Estimation

To fulfil the research's objective and evaluate the relationship between the price-earnings (P/E) ratio and the financial viability of commercial banks, the following specific model is developed to express one dependent variable taken for this analysis.

$$Y = \beta0 + \beta1\ X1 + \beta2\ X2 + \beta3\ X3 + \beta4\ X4 + \beta5\ X5 + \beta6\ X6 + \varepsilon$$

In this model, Y represents the Price-Earnings (P/E) Ratio, X signifies the independent variables, and ε denotes the error term. Accordingly, the regression model is structured as follows:

$$\text{P/E Ratio} = \beta0 + \beta1\text{LQR} + \beta2\ \text{LV} + \beta3\ \text{NPM} + \beta4\ \text{NIM} + \beta5\ \text{NPL} + \beta6\ \text{ROE} + \varepsilon$$

Here, P/E Ratio =Dependent Variable, α = Constant, β =Regression Coefficient, i = Cross-Sectional Aspect of Various Banks, t = Time Period, $\in$ = Error Term.

ANALYSIS AND DISCUSSION

Descriptive Statistics Results

Descriptive statistics provide numerical summaries highlighting and simplifying a dataset's essential features. These metrics, such as the mean, median, and standard deviation, which offer insight into the data's central tendency and variability. Table 1 presents descriptive statistics, which offers valuable insights into the data's central tendencies, spread, and extremities. Such information is crucial in understanding the dataset's characteristics, aiding researchers in making informed decisions during analysis.

Table 1: Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
PE	300	16.82	45.163	-7.02	566.02
LQR	300	0.748	4.167	-0.016	71.981

LR	300	0.568	0.774	-1.376	9.024
NPM	300	0.251	13.059	-177.869	120.621
NIM	300	0.325	2.323	-0.049	27.868
NPL	300	0.076	0.102	0.000	0.633
ROE	300	0.070	0.199	-2.155	0.222

Source: Compiled by author

Descriptive statistics for the variables being examined are shown in Table 1. The Price Earnings (P/E) ratio has notable diversity, with extreme values ranging from -7.02 to 566.02 and a mean of 16.82 with a high standard deviation of 45.163. It suggests that during periods of high volatility in the P/E ratio investors may be reacting strongly to market news, economic indicators, or changes in the company's fundamentals. This could be due to factors such as changes in management, industry trends, competitive dynamics, or economic conditions. The liquidity ratio (LQR) shows significant variation, with values ranging from -0.016 to 71.981, with a mean of 0.748 and a standard deviation of 4.167. Various levels of financial leverage are indicated by the leverage ratio (LR), which has a mean of 0.568 and a standard deviation of 0.774. Values range from -1.376 to 9.024. With a mean of 0.251 and a high standard deviation of 13.059, the net profit margin (NPM) shows a considerable range in profitability, with extreme values ranging from -177.869 to 120.621. With a mean of 0.325 and a standard deviation of 2.323, the net interest margin (NIM) indicates significant variation in interest margins, with values ranging from -0.049 to 27.868. Low yet fluctuating levels of non-performing loans are indicated by the non-performing loan (NPL) mean of 0.076 and standard deviation of 0.102, with values ranging from 0 to 0.633. The return on equity (ROE) range is -2.155 to 0.222, with a mean of 0.07 and a standard deviation of 0.199. This implies that the sample's profitability was low and inconsistent. The data indicate significant variation and the existence of outliers in many variables.

Correlation Analysis

A correlation coefficient is applied to determine whether there is a substantial relationship between the variables. Table 2 shows the correlation between the bank's performance, the dependent variable, and the various profitability indicators. The Pearson correlation method is applied for this analysis, and every variable is looked at a 5% significance level.

Table 2: Correlation Analysis

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
(1) PE	1.000						
(2) LQR	-0.023	1.000					
(3) LR	0.019	-0.016	1.000				
(4) NPM	0.044	0.000	-0.024	1.000			
(5) NIM	-0.017	0.042	0.415	0.000	1.000		
(6) NPL	0.053	-0.038	-0.063	-0.239	0.058	1.000	
(7) ROE	-0.041	0.035	0.090	0.135	-0.017	-0.749	1.000

Source: Compiled by author

The correlation analysis presented in Table 2 reveals the linear relationships between various financial

variables. The first variable, Price Earnings (PE), exhibits a weak negative correlation with liquidity ratio (LQR) at -0.023, suggesting a negligible inverse relationship. Additionally, PE shows a slight positive correlation with leverage ratio (LR) (0.019), with minimal implications for their relationship. The net profit margin (NPM) also demonstrates a weak positive association with PE (0.044), implying a slight tendency for higher PE ratios to align with improved profitability. Net interest margin (NIM) negatively correlates with PE (-0.017), indicating that higher PE values do not appear to correlate with a better net interest margin. A more substantial positive relationship is observed between NIM and LR (0.042), which could imply that higher leverage is associated with improved net interest margins. The correlation between NIM and NPL is weak (0.058), suggesting that non-performing loans have an insignificant impact on the interest margin. Non-performing loans (NPL) correlate notably negatively with ROE (-0.749), revealing a strong inverse relationship between the two.

However, this suggests that an increase in non-performing loans is likely to adversely affect the return on equity, a critical indicator of profitability. In contrast, the relationship between NPL and other variables, such as NPM, LR, and NIM, shows weak correlations, implying a limited impact from non-performing loans on these variables. Finally, the correlation between return on equity (ROE) and other variables remains relatively weak, with minimal positive or negative associations. These findings suggest that changes less influence profitability measures such as ROE in liquidity, leverage, and net interest margins but are significantly impacted by non-performing loans.

Diagnostic Tests

The following are diagnostic tests conducted to identify and address critical issues that could impact outcomes, ensuring the validity and reliability of regression models.

Unit Root Test

The unit root test determines whether the data panel contains a unit root, indicating non-stationarity. Non-stationary variables can lead to unreliable results in regression models. The unit root test was conducted on the P/E panel data series to check for stability. The model can produce more reliable and efficient parameter estimates by eliminating non-stationary variables.

Table 3 shows the Panel unit root test which was conducted to ascertain the stationarity of the panel dataset.

Table 3: Levin-Lin-Chu Unit Root Test

Variable	P-Value	Remark
PE	0.0000	Stationary
LQR	0.0000	Stationary
LR	0.0036	Stationary
NPM	0.0000	Stationary
NIM	0.0000	Stationary
NPL	0.0000	Stationary
ROE	0.0000	Stationary

Source: Compiled by author

The Levin-Lin-Chu unit root test was conducted to evaluate the stationarity of the panels. The null hypothesis (H_0) assumes the presence of unit roots, implying non-stationarity, while the alternative hypothesis (H_1) indicates that the panels are stationary. The test results revealed that all other variables in the dataset had significant p-values (below 0.005). Consequently, the null hypothesis was rejected for these variables,

confirming their stationarity.

Multicollinearity Test

Multicollinearity in a regression model describes a high correlation between two or more independent variables. Coefficient estimates may become unstable as a result of this situation, making it challenging to pinpoint the precise ways in which each variable affects the dependent variable. So, the Variance Inflation Factor (VIF) test has to be conducted for each variable to assess collinearity among the independent variables in the regression model. To determine whether multicollinearity exists between the independent variables, Cameron & Trivedi's decomposition of IM-test findings are shown in Table 4.

Table 4: Variance Inflation Factor

Variables	VIF	1/VIF
NPL	2.397	.417
ROE	2.296	.436
LR	1.228	.815
NIM	1.224	.817
NPM	1.068	.936
LQR	1.005	.995
Mean VIF	1.536	

Source: Compiled by author

The highest VIF value was 2.397 for NPL, while LQR had the lowest at 1.005, with an average VIF of 1.536. These results indicate that each variable contributes distinct and independent information, ensuring the effects on the P/E ratio are identifiable. The absence of multicollinearity enhances the reliability of the regression model, allowing for a more valid interpretation of the independent variable's impact on the P/E ratio. Overall, the VIF analysis confirms that multicollinearity is not a concern, reinforcing the credibility of the findings and supporting the model's suitability for evaluating factors influencing company valuation.

Autocorrelation Test

Autocorrelation refers to the correlation of a variable with its lagged values. To some extent, it can help in removing the heteroskedasticity problem by capturing the serial correlation in the residuals, making the error terms more homoscedastic. So, it can reduce the impact of varying error terms. However, it may not fully address the issue, and other techniques like clustered standard errors might be needed for more robust results. Table 5 shows that the Wooldridge test is commonly used for autocorrelation in panel data estimation. This test extends the Durbin-Watson test for panel data and is appropriate for both balanced and unbalanced panel datasets.

Table 5: Wooldridge Test for Autocorrelation

Statistic	Degrees of Freedom	P-value	Remarks
F (1, 29) = 188.571	(1, 29)	0.0000	Reject the null hypothesis (first-order autocorrelation present)

Source: Compiled by author

To find out if there was autocorrelation in the panel data model's error terms, the Wooldridge test for first-order autocorrelation was used. First-order autocorrelation is assumed to be absent in the null hypothesis (H_0). The

test produced a p-value of 0.0000 and an F-statistic of 188.571 with degrees of freedom (1, 29). The presence of first-order autocorrelation is confirmed by rejecting the null hypothesis because the p-value is less than the conventional 0.05 significance level. In panel data analysis, autocorrelation is a frequent problem that can affect estimators' effectiveness. In order to guarantee the dependability of the study findings, suitable modifications will be implemented.

Endogeneity Test

Endogeneity test checks for the presence of endogeneity, where a variable is influenced by other variables in a statistical model. It helps identify and address potential biases, ensuring the reliability of causal relationships in econometric analyses. Table 6 shows the Durbin-Wu-Hausman test to check for endogeneity.

Table 6: Endogeneity Test

Variables	Prob>F	Remarks
LQR	0.7804	Exogenous
LR	0.5334	Exogenous
NPM	0.3042	Exogenous
NIM	0.5624	Exogenous
NPL	0.4222	Exogenous
ROE	0.9880	Exogenous

Source: Compiled by author

The endogeneity test results, as shown in Table 6 reveal no significant evidence of endogeneity in the examined models. The F-statistics and associated p-values show that the null hypothesis of no endogeneity cannot be rejected for the majority of the variables under examination. In contrast to the LR model, which displays a p-value of 0.5334, the LQR model provides with a p-value of 0.7804. These results imply that there is no endogeneity, which means that there is neither concurrent causality nor substantial bias in the models. The presumption of exogeneity is thus valid.

With a p-value of 0.3042, the NPM model further supports the finding that endogeneity is not an issue. The NIM model further supports the lack of endogeneity with an F-statistic of 0.34 and a p-value of 0.5624. In the NPL model, the results support the conclusion that endogeneity is not a serious problem, even with an F-statistic of 0.65 and a p-value of 0.4222. Furthermore, the ROE model, with an F-statistic of 0 and a p-value of 0.9880, provides strong evidence that endogeneity does not affect the model. These findings collectively suggest that the models are correctly specified, and endogeneity does not compromise the results.

Hausman Test Output

The Hausman test determines whether a fixed-effects or random-effects model is more appropriate by comparing their estimates.

Table 7: Hausman Specification Test

Test	Coefficient
Chi-square test value	-64.878
P-value	0.03

Source: Compiled by author

The Hausman test establishes whether the Fixed-effects or Random-effects model better suits the data. It looks for a correlation between the regressors and the unique errors, which are represented by ui. The null hypothesis refers to the fact that they are uncorrelated. At the 0.05 significance level, the calculated Chi-square value of 0.03 is statistically insignificant. Because of this, the null hypothesis cannot be disproved, indicating that the Fixed-effects model is a better option in this instance than the Random-effects model.

Fixed Effects Regression Analysis

The fixed-effects regression model with clustered standard errors has been employed to control and mitigate potential autocorrelation within banks. This methodology ensures robust and reliable estimates by accounting for intra-bank correlation, allowing for precise identification of the effects of financial variables on the PE ratio.

Table 8: Fixed Effects Regression Analysis with Clustered Standard Errors

Variables	Coef.	St.Err.	t-value	p-value	[95% Conf. Interval]	Significance
LQR	-0.277	1.544	-0.18	.8591	-3.435	
LR	2.982	3.129	0.95	.3494	-3.418	
NPM	-0.121	0.086	-1.41	.0171	-0.298	**
NIM	-1.271	1.025	-1.24	.2253	-3.367	
NPL	-3.644	1.359	-1.55	.0131	-15.104	**
ROE	21.246	1.290	4.33	.0019	44.122	***
Constant	58.933	28.012	2.10	.0443	1.642	**
Mean dependent var		16.885		SD dependent var		16.065
R-squared		0.658		Number of Obs		300
F-test		13.129		Prob > F		0.017
Akaike crit. (AIC)		76.545		Bayesian crit. (BIC)		78.734

*** p<0.01, ** p<0.05, * p<0.1

Source: Compiled by author

The fixed-effects regression model with clustered standard errors has been employed to investigate the relationship between key financial performance indicators and the Price-Earnings (PE) ratio, with the clustering done at the bank level to account for potential autocorrelation. The results reveal several notable findings. The liquidity ratio (LQR) shows a negative but insignificant relationship with the PE ratio (p-value = 0.859), suggesting that liquidity does not significantly impact the market valuations of banks in this study. Similarly, the leverage ratio (LR) demonstrates a positive but insignificant effect on the PE ratio (p-value = 0.349), indicating that leverage does not meaningfully affect the market valuation in this context.

The net profit margin (NPM) has a statistically significant negative relationship with the PE ratio (p-value = 0.017), suggesting that banks with higher profitability tend to have lower PE ratios. The net interest margin (NIM) exhibits a negative but statistically insignificant effect on the PE ratio (p-value is 0.225), indicating that the net interest margin does not significantly influence market valuation. The NPL shows a significant negative relationship with the PE ratio (p-value is 0.0131), implying that higher non-performing loans, a sign of financial instability, are associated with lower PE ratios. The return on equity (ROE) demonstrates a strong

positive effect on the PE ratio (p-value is 0.00194), indicating that banks with higher return on equity are valued more highly by the market, reflecting investor confidence in their profitability and performance.

However, with the R-squared value of 0.658, the model explains 65.8% of the variation in the PE ratio. This indicates a solid fit, suggesting that the model captures a substantial portion of the underlying relationships between the variables. The F-test statistic (13.129, p-value = 0.017) supports the overall significance of the model, confirming that the predictors included in the regression collectively contribute to explaining the variation in the PE ratio. Additionally, the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values of 76.545 and 78.734, respectively, suggest that the model is well-specified and balances goodness of fit with model complexity. Moreover, the fixed-effects regression model with clustered standard errors provides reliable estimates with significant findings that are consistent with real-world financial theory. The model's fit and robustness indicate that it effectively captures the key drivers of bank valuations, such as profitability, asset quality, and return on equity.

Hypothesis Revised

Table 9: Hypotheses Revised

Hypotheses	Description	P/E	Remarks
$H_0$1	Liquidity ratio (LQR) has no significant impact on P/E ratio.	Not Rejected	p-value>0.05 (Insignificant)
$H_0$2	Leverage ratio (LR) has no significant impact on P/E ratio.	Not Rejected	p-value>0.05 (Insignificant)
$H_0$3	Net Profit Margin (NPM) has no significant impact on P/E ratio.	Rejected	p-value<0.05 (Negative significant)
$H_0$4	Net Interest Margin (NIM) has no significant impact on P/E ratio.	Not Rejected	p-value>0.05 (Insignificant)
$H_0$5	Non-Performing Loan Ratio (NPL) has no significant impact on P/E ratio.	Rejected	p-value<0.05 (Negative significant)
$H_0$6	Return on Equity (ROE) has no significant impact on P/E ratio.	Rejected	p-value<0.01 (Positive significant)

FINDINGS OF THE STUDY

This study's main goal is to investigate the relationship between commercial banks' financial health and the price-earnings (P/E) ratio. The study focuses on 30 commercial banks using a descriptive research design in order to accomplish this purpose. The secondary data spanning 10 years (2014 to 2023) have been collected and analyzed through descriptive statistical methods and panelized multiple regression models using the Fixed Effects Regression with Clustered Standard Error. Due to the COVID-19 pandemic situation, business activities and the economy have been affected badly. As a result, the banking industry of Bangladesh has suffered lots of scams and irregularities, which are reflected in this research. This study found that some variables are insignificant in the price-earnings ratio. The results of the fixed-effects regression analysis revealed several important findings. The liquidity ratio (LQR) showed a negative but statistically insignificant relationship with the P/E ratio, with a p-value of 0.859, suggesting that liquidity does not significantly impact the market valuations of banks. Similarly, the leverage ratio (LR) exhibited a positive but insignificant effect on the P/E ratio (p-value = 0.349), indicating that leverage does not meaningfully affect the market valuation in this context. The net profit margin (NPM) displayed a significant negative relationship with the dependent variable, implying that banks with higher profitability are associated with lower P/E ratios. This finding may reflect investor perceptions, where higher profitability signals greater financial stability, which could result in a

lower market valuation due to the perception of reduced growth potential. The net interest margin (NIM) exhibited a negative but statistically insignificant effect on the P/E ratio (p-value = 0.225), showing that the net interest margin does not significantly influence market valuation.

On the other hand, the non-performing loan ratio (NPL) showed a significant negative relationship with the P/E ratio (p-value= 0.0131), indicating that higher non-performing loans, which are a sign of financial instability, are associated with lower P/E ratios. This is consistent with investor concerns about credit risk and the financial health of banks. The return on equity (ROE) demonstrated a strong positive effect on the P/E ratio (p-value = 0.0019), suggesting that banks with higher return on equity are more highly valued by the market, reflecting investor confidence in their profitability and performance. After that, model fit statistics further support these findings, with the R-squared value of 0.658, meaning that the model explains 65.8% of the variation in the P/E ratio. This indicates that the model effectively captures a substantial portion of the relationship between the variables. Besides, the F-test statistic (13.129, p-value = 0.017) indicates the overall significance of the model, confirming that the predictors included in the regression collectively explain the variation in the P/E ratio. The Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values of 76.545 and 78.734, respectively, suggest that the model is well-specified, balancing goodness of fit and model complexity. Besides this, the Shapiro-Wilk test reveals non-normality for all variables, necessitating robust statistical methods. Multicollinearity is not a concern, as evidenced by low VIF values. Heteroskedasticity was ruled out via White's test, confirming homoscedasticity. However, the Wooldridge test indicates the presence of first-order autocorrelation, suggesting the need for appropriate model adjustments. Hence, these findings provide a robust foundation for further analysis and policy implications in the banking sector.

CONCLUSION

This study examined a sample of 30 commercial banks from 2014 to 2023. The study sought to investigate the relationship between financial performance in the banking industry and the P/E ratio, a crucial indicator of market value, using a descriptive research design and secondary data analysis. The results provide important new information about the financial dynamics of the banking industry, especially in the post-pandemic era, using descriptive statistics and the Fixed Effects Regression model with Clustered Standard Error.

The fixed-effects regression analysis reveals that net profit margin (NPM) and non-performing loan ratio (NPL) had a negative effect on the P/E ratio, indicating a decline in market value in the face of financial instability. On the other hand, the P/E ratio and return on equity (ROE) showed a substantial positive correlation, suggesting that increased profitability contributes to increased investor confidence. Due to economic disruptions and irregularities, other parameters like the liquidity ratio (LQR), leverage ratio (LR), and net interest margin (NIM) displayed negligible effects. This finding is attributed to the broader challenges the banking sector faces, including the economic disruptions and irregularities during the post-pandemic period, which reduced the predictive power of the P/E ratio. Data dependability was guaranteed using stationarity test and multicollinearity diagnostics. The study contributes to the empirical literature by demonstrating the limitations of traditional financial metrics, especially during periods of economic distress, and underscores the necessity of integrating external factors like economic shocks in financial stability assessments. This research highlights the evolving dynamics of the Bangladeshi banking sector and calls for future studies incorporating broader variables to better capture resilience and financial stability during crises.

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