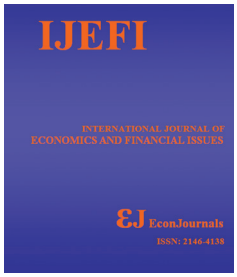

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Investigating the Impact of Bank-specific Determinants on Stock Price of Listed Commercial Banks: Evidence from Emerging Economy

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ABSTRACT

This paper attempts to investigate the impact of bank-specific determinants on the stock price of Dhaka Stock Exchange (DSE) listed commercial banks in Bangladesh. Several bank-specific factors such as Book to Market Ratio, Return on Equity, Price/Earnings to Growth Ratio, Cash Flow per Share, Debt to Equity Ratio, Earnings per Share, Dividend per Share, Bank Size and Institutional Ownership Percentage have been analyzed for this study and tried to see the impact of each variable on the change in market price of share of 10 listed commercial banks spanning from 2011 to 2020. In empirical discussion four estimation models such as Fixed effects, Random effects, GLS, and Pooled OLS approach have been used to ensure the robustness of the models. To examine the validity of the models chosen for this study, the model specification test and many diagnostic checks were used, including the test of heteroskedasticity, the cross-sectional dependence test, the test of autocorrelation and the unit root test, etc. Our investiagtion reveals that only Bank Size and Book to Market Value explanatory variables are found significantly responsible for fluctuation in the change in share price of banks, contributing to the current literature by revealing the importance of bank-specific factors that include all metrics in their calculation. As a result, Bangladesh's DSE-listed banks should take appropriate measures to boost their stock values, such as attempting to improve the ratio that has a positive impact on the share price while decreasing the ratio that has a negative impact.

Keywords: ROE, Book to Market Value, Debt to Equity, Bank Size, GLS
JEL Classifications: C23, G21

1. INTRODUCTION

Bank as a medium of fund transfer between surplus and deficit units are now playing a significant role in the economic development of Bangladesh. The banking sector of the economy holds 17.80% of market capitalization. This sector has also undergone a very unfavorable momentum during the 2010-11 stock market crash. So considering this change in this important sector of the economy, investors and policymakers must know about what factors affect the stock price of banks in Bangladesh. From investors' perception, bank stocks become safe investment instruments. For this reason, many investors are now keen to engage in the banking sector. This significant amount of market capital indicates a decent price for shares in the banking sector, implying that investors are very interested in purchasing shares in this sector and looking for a way to beat the market while earning a high return. So, it is crucial for them to forecast future share price movements in this industry. According to financial theorists, the stock price is the present value of all expected future earnings for the company, divided by the number of outstanding shares, meaning that the price is determined by the company's earning potential. However, because there are multiple factors influencing price change, it is difficult to anticipate. But, in reality, these unpredictable stock values are determined by a variety of variables that no expert can reliably comprehend or forecast.

Bangladesh's capital market is one of the smallest in Asia, yet it ranks third in South Asia. Since 2011, the Dhaka stock exchange has gone considerable modifications due to the stock market crash. After multiple downturns and declines throughout the years, the Bangladesh Stock Market will eventually settle at a gradual pace. Investors hope for a robust stock market and management that is free of political influence and infallible. Currently, 17.80% of the market capitalization is held by the banking sector of the economy. This shows that banks play a major role in Bangladesh's financial system. Because of this, investors on both the primary and secondary markets are interested in investing in private commercial banks. So, this paper aimed to hold a contribution in investor's informed investment selections based on the highlighted factors and also assist policymakers to take consideration of important factors of the share price of banks in shaping their policy and policy implementation. Furthermore, there has been little research in this key sector of investing, therefore this work attempted to look at the big picture and extract some lessons.

The objective of this paper is to identify the impact of influential bank-specific variables on the share price of DSE-listed banks in Bangladesh specifically to find out how much various bank-specific factors are responsible for impacting the change in stock price of commercial banks in Bangladesh. The factors which influence stock prices can indeed be divided into internal and external elements. Internal factors like Book to Market Ratio, Return on Equity, Price/Earnings to Growth Ratio, Cash Flow per Share, Debt to Equity Ratio, Earnings per Share, Dividend per Share, Bank Size and Institutional Ownership Percentage are all important. External factors like Inflation rate, Money Supply, DSE index, Remittance. But this study mainly focused on the bank-specific factor's influence on 10 Dhaka stock exchange (DSE) listed commercial bank's change in share prices from 2011 to 2020.

Based on the aforementioned goal, the remainder of this study is organized as follows: The next section provides reviews of the literature, followed by the study's research methodologies. The empirical results and discussion are presented in the fourth section, while the study's conclusion along with the recommendations is presented in the last section.

2. LITERATURE REVIEW

The findings of various studies have shed light on some of the major determinants of bank stock price change. The empirical findings of these studies vary in general due to differences in datasets, periods, investigated environments and countries. However, some mutual elements were discovered, allowing the determinants of banking stock prices to be classified. Various studies on bank-specific factors and both micro and macroeconomic factors are listed below:

Khan (2012) investigated the factors influencing share prices on the Karachi Stock Exchange. From 2000 to 2009, the study examined 34 KSE-listed companies. The independent variables chosen were the Book to Market (B/M) ratio, Price Earning (P/E) ratio, Dividend, GDP and Interest Rate. The analysis discovered that all variables had a significant positive impact on the share price, except the B/M ratio and interest rate, which had a negative impact on the share price.

Arshad et al. (2015) identifies factors in the stock price of listed commercial banks in Pakistan. They studied 22 banks listed on the Karachi Stock Exchange between 2007 and 2013, focusing on both internal and external variables and employing variables such as GDP, Interest Rate, Leverage, Dividend per Share, Earnings per Share and Price Earnings Ratio and Book Market Ratio. They discovered that EPS had a considerable beneficial impact on the stock price. The book to market value ratio and the interest rate has a negative substantial relationship with the stock price of banks, while other variables show no such relationship.

Wadud (2017) stated some influential bank-specific factors were determinants of the stock price of listed commercial banks in Bangladesh. From 2007 to 2016, he collected data from 30 DSE-listed banks, focusing on variables such as interest rate, net asset value per share, book market ratio, dividend per share, price - earnings ratio (P/E ratio), leverage and earnings per share. The total number of outstanding shares, book value per share, return on equity (roe), total age of the company, the total size of the company and other factors influence the stock price of banks. He discovered that net asset value per share, dividend per share, leverage, the book to market ratio, earnings per share and return on equity are all important. The price-earnings ratio, book value per share, total age of the bank and total size of the bank all have a significant impact on the stock price of the bank.

Rjoub et al. (2017) investigated the impact of a set of micro and macroeconomic variables on the stock price of Turkish banks from the third quarter of 1995 to the fourth quarter of 2015. The variables studied were capital adequacy, asset quality, management quality, earnings, liquidity, inflation, exchange rate, industrial production, interest rates and the money supply. They discovered that stock price is significantly related to asset quality, management quality, earnings, size, money supply and interest rate. The findings also revealed that bank stock prices react negatively to the economic downturn.

Chowdhury et al. (2019) investigated the determinants of a financial institution's stock price in Bangladesh. They collected data from 30 banks and 18 non-bank financial institutions listed on the DSE between 2011 and 2015, focusing on specific variables such as dividend, price-earnings ratio (P/E), net asset value (NAV), earnings per share (EPS), dividend payout ratio and the size of the share price movement. Dividend, P/E, NAV, EPS, Dividend Payout Ratio and size were discovered to have a significant impact on the stock price of banks. Dividend, P/E, Dividend Payout Ratio and NAV-variables, on the other hand, had a significant impact on the stock price for non-bank financial institutions.

Raj and Dalvadi (2020) investigated the relationship between dividend policy determinants and the market price of public sector bank shares in India. Profitability (ROE and EPS), liquidity (Current Ratio), leverage (Total Debt to Total Assets Ratio), size (LN of Total Assets), dividend policy (DPS, DPO and DY) and risk (P/E Ratio) were examined as independent variables for

seven public sector banks from 2014-15 to 2018-19. The analysis discovered that liquidity, size and leverage have a significant positive impact on share price, profitability, risk and dividend policy have a positive but insignificant relationship with share price and growth has an insignificant relationship with the share price of selected PSBs.

Nurfauzi et al. (2020) investigated the factors that influence the stock price of financial firms listed on the Indonesia Capital Market. For the period 2009-2018, the study used various microeconomic variables such as leverage, profitability, institutional ownership, dividend policy and firm size for 15 financial firms. According to the findings, leverage had a negative effect on profitability, firm size had a positive effect and institutional ownership and dividend did not affect stock price.

Hossain (2020) examined the underlying variables influencing share price volatility in Bangladesh, focusing on private commercial banks listed on the Dhaka Stock Exchange (DSE) Ltd. From 2014 to 2018, the share prices of 18 commercial banks listed on the DSE were included for analysis, comprising 90 observations. The study's empirical findings indicate that earnings per share, dividends per share, bank size, and non-performing loan to total loans all have a substantial impact on share price.

Gharaibeh and Jaradat (2021) examined the impact of risk, size, profitability, earnings per share, dividend yield and book-to-market equity on Jordanian bank stock prices listed on the Amman Stock Exchange (ASE) from 2006 to 2018. The study discovered that among all variables, ROA had the most significant positive effect and risk factors also had a significant positive effect. SIZE, DY and BE/ME, on the other hand, have a significant negative impact on stock prices.

Wagle (2021) used a set of dependent and independent variables to investigate the determinants of stock prices in Nepal from 2015/16 to 2019/20. According to the findings, the Market to Book (M/B), Price-Earnings (P/E) and Earnings Yield (E/Y) ratios all had a significant positive relationship with the stock market price. In contrast, the Dividend Yield Ratio (D/Y) has a small but positive impact on stock market price.

Pandey and Sunar (2022) investigated the relationship between bank-specific variables and equity share prices in Nepali banks. For the sample of five banks over 10-years, the bank-specific variables taken were Retention Ratio, Dividend Per Share, Dividend Payout Ratio, Earning Per Share and Return on Equity. Except for the Retention Ratio, which had a negative relationship with the share price, the study found that all variables had a significant positive impact on the share price.

2.1. Literature Gap

Investing decisions are heavily influenced by understanding the impact of bank-specific drivers on bank stock prices. Many nations, both developed and developing, such Ghana, Jordan, India, Nepal, Pakistan, and Nigeria, have conducted studies on the factors that affect the stock price of banks. There is a lack of depth and breadth in the extant literature on the factors that affect bank stock prices in Bangladesh. In light of this knowledge gap, this research endeavors to illustrate the effect of several bank-specific characteristics on the stock price and the change in stock price of listed banks in Bangladesh, with the ultimate goal of assisting investors in Bangladesh in analyzing their investment decisions in light of the study's findings.

This concludes our literature review on the factors that affect the stock price of commercial banks in Bangladesh. The study approach will be discussed in depth in the next chapter.

2.2. Development of Hypothesis

The following hypothesis has been developed to examine the impact of various bank-specific factors on the stock price of banks:

H_0: There is no significant relationship between the CMPS and various bank-specific variables

H_1: There is a significant relationship between the CMPS and various bank-specific variables.

3. DATA AND METHODS

This is explanatory research that investigates the impact of bank-specific variables on the stock price of banks in Bangladesh. The study will analyze various internal variables such as Book to Market Ratio, Return on Equity, Price/Earnings to Growth Ratio, Cash Flow per Share, Debt to Equity Ratio, Earnings per Share, Dividend per Share, Bank Size and Institutional Ownership Percentage. The study will encompass both quantitative and qualitative analysis.

Table 1 provides information on chosen variables along with the expected impact on the dependent variable in the empirical literature for multiple regression analysis.

The + (Positive) sign indicates that the independent variable has a positive impact on the dependent variable, if that coefficient increases the change in share price also increases and vice versa. On the other hand, the – (Negative) sign means, the independent variable has a negative relation with the share price, if that coefficient increases the change in share price will decrease and vice versa.

The sample of 10 banks has taken by taking into consideration both Conventional and Islamic banks but excluded the government commercial banks as their performance is not much satisfactory which will not give the analysis an accurate understanding of determinants of the share price of banks. The data covers a period starting from 2011 to 2020. The choice of a period of 10 years was considered reasonable to ensure the availability of necessary data.

The following econometric model has been developed to investigate the impact of various bank-specific factors on the stock price of the bank through regression analysis:

$$CMPS_{it} = \alpha_{it} + \sum_{k=1}^{10} \delta_{it} X_{itk} + \varepsilon_{it} \quad (1)$$

Table 1: Description of variables included in the models

Variables	Notation	Expected impact	Data source
Bank specific change in share price (Dependent variable)	Change in market price of share (CMPS)	-	Annual Report
Independent variables:			
Company valuation	Book to market value ratio (BV/MV)	- (Negative)	Annual Report
Profitability	Return on equity (ROE)	+ (Positive)	Annual Report
Market growth	Price/earnings to growth ratio (PEGR)	- (Negative)	Annual Report
Liquidity	Cash flow per share (CFPS)	+ (Positive)	Annual Report
Solvency	Debt-equity ratio (DER)	- (Negative)	Annual Report
Market prospect ratios	Earnings per share (EPS)	+ (Positive)	Annual Report
Dividend policy	Dividend per share (DPS)	+ (Positive)	Annual Report
Size	Bank size (BS)	+(Positive)	Annual Report
Institutional ownership	Institutional ownership percentage (IO)	+ (Positive)	Annual Report

Source: Author's own observation

$$CMPS_{it} = \alpha_{it} + \sum_{k=1}^{10} \delta_{it} X_{itk} + \mu_{it} + \varepsilon_{it} \quad (2)$$

Where,

CMPS = Change in Market Price Per Share that acts as the fluctuation rate of market value of the share of selected listed commercial banks',

$\sum X$ = all of the explanatory variables acts as determinants of the share price of selected listed commercial banks,

εit = within entity error/error term,

μit = between entity error and

αit = constant.

To estimate the coefficients in equation 01, the fixed-effects approach was used to illustrate the relationship between CMPS and the bank-specific variables listed as regressors in the model investigating the nexus between these regressors and dependent variables within the banks. It's assumed in Fixed-effects that some variables within the individual may influence or bias the regressors or dependent factors and it's needed to be controlled, which is why the assumption of the nexus between the entity's error term and the independent variable, followed by the alphabetical correlation (εit), makes sense. To further compare the outcomes of the approaches, cross-sectional Generalized Least Square Technique and Pooled Ordinary Least Square have been used to depict the coefficients included in the models.

Furthermore, the Random-effects approach has been used to illustrate the factors in equation 02 that demonstrate the causality between CMPS and other regressors as described earlier. The premise that the variation within the entities (Commercial Bank) is uncorrelated and random with the explanatory components of the estimations justifies the use of the random effects method.

4. EMPIRICAL RESULTS

This section of the study is going to provide the degree of the significant impact of several bank-specific models in explaining the change in market price per share. For seeing the impact on change in market price per share a rigorous multiple regression analysis by different statistical models has been conducted. Lastly, finds out the best method to explain the results and conducts several diagnostic tests for the models.

4.1. Summary Statistics

4.1.1. Descriptive statistics

The following Table 2 are the summary statistics for all variables in the aforementioned models:

Table 2, which depicts the descriptive statistics for all nine independent variables influencing the change in share price of 10 commercial banks in Bangladesh that are listed and traded on the DSE. The change in share price ranges from −1.03 to 1.2, with a mean value of −0.1087 and a standard deviation of 0.329394. The change in share price indicates that deviations in value is not that much large that means over the time the banks could maintain the stability of change in their share price through their respective bank-specific factor's excellence. The summary statistics of the independent variables appear to be consistent, with relatively low values of standard deviation and narrower gaps between ranges of variables, as determined by the minimum and maximum values except for two independent variables, namely Price/Earnings to Growth Ratio and Cash Flow Per Share. The Price/Earnings to Growth Ratio has extreme values in affecting the share price of banks with a minimum value of −1334.4 and maximum value of 1826.28; whereas the mean value is 10.2282 and the standard deviation is 306.8847. This result suggests that the market growth of the banks is much more volatile and this volatility affects the change in stock price of a bank. The other variable Cash Flow Per Share has a slightly higher standard deviation of 13.9387 with a mean value of 8.547326 and data ranges from −18.39915 to 58.65651. This result implies that on average the cash flow of banks is volatile. Among all variables Bank Size has the highest mean and Return on Equity has the lowest standard deviation.

4.2. Normality Test

A non-significant result ($P>0.05$) indicates a normal distribution. Meanwhile, a significant result ($P<0.05$) indicates that the distribution deviates from the normality assumption. Table 3 shows that among all the variables chosen the P-value of three variables namely Return on Equity, Debt-Equity Ratio and Bank Size have a non-significant result ($P>0.05$) which means these three variables follow the normal distribution. On the other hand, the P-value of all other variables is <0.05. So, as a whole, the data set deviates from the normality assumption. This study used a large sample size, so no significant deviations from the assumption of normality of the error terms were found.

Table 2: Descriptive statistics

Variables	Observations	Mean	SD	Minimum	Maximum
Change in market price per share	100	−0.1087	0.329394	−1.03	1.2
Book to market value ratio	100	1.0358	0.515823	0.22	3.81
Return on equity	100	0.123748	0.051866	0.0008	0.27
Price/earnings to growth ratio	100	10.2282	306.8847	−1334.4	1826.28
Cash flow per share	100	8.547326	13.9387	−18.3992	58.65651
Debt-equity ratio	100	11.90774	2.304519	5.794	16.44
Earnings per share	100	3.466	3.261025	0.02	21
Dividend per share	100	1.504674	0.843023	0.00008	4.18656
Bank size	100	26.14072	0.403827	25.23969	26.9244
Institutional ownership percentage	100	0.245981	0.161131	0.0284	0.6482

Source: Based on the output generated from STATA 12.0

Table 3: Test for normal data

Shapiro-Wilk W test for normal data					
Variables	Observations	W	V	Z	Prob>z
Change in Market Price Per Share	100	0.9604	3.269	2.628	0.0043
Book to Market Value Ratio	100	0.85414	12.043	5.52	0.0000
Return on Equity	100	0.9834	1.371	0.7	0.24209
Price/Earnings to Growth Ratio	100	0.64968	28.924	7.464	0.0000
Cash Flow Per Share	100	0.94548	4.502	3.337	0.00042
Debt-Equity Ratio	100	0.98654	1.111	0.234	0.40763
Earnings Per Share	100	0.6832	26.156	7.241	0.0000
Dividend Per Share	100	0.92551	6.15	4.03	0.00003
Bank Size	100	0.97507	2.058	1.601	0.05469
Institutional Ownership Percentage	100	0.89931	8.313	4.698	0.0000

Source: Based on the output generated from STATA 12.0

The coefficients of several bank-specific factors explaining the Change in Market Price Per Share (CMPS) of commercial banks have been estimated in following Table 4 to illustrate the impact of several bank-specific factors on the change in share price of banks utilizing various approaches including the Random Effects Model, Fixed Effects Model, Generalized Least Square (GLS) and Pooled OLS standing for ordinary least square method. The empirical model for this analysis has given below:

This output of estimators indicates that under the fixed effects model one explanatory variable, Bank Size found statistically significant at the selected level of significance (1% level of significance) in explaining the fluctuation of the change in market price per share.

The coefficients estimated under random effects, GLS and OLS approaches divulge that Bank size and Book to Market value ratio are found statistically significant at the chosen level of significance in explaining the variation in dependent variable measured with CMPS of selected commercial banks.

Under the random-effects method and generalized least square (GLS) method, the Chi-square value of 30.171761 and 33.524179 respectively divulges the joint significance of all bank-specific factors included in the model in explaining the fluctuations of changes in share price measured with the CMPS ratio of banks at 1% level of significance. More precisely, all independent or explanatory variables such as Book to Market Value Ratio, Return on Equity, Price/Earnings to Growth Ratio, Cash Flow Per Share, Debt-Equity Ratio, Earnings Per Share, Dividend Per Share, Bank Size and Institutional Ownership Percentage are jointly affecting the dependent variable measured with CMPS ratio.

Additionally, the R^2 value of 0.1162 and 0.2296 estimated under fixed effects and OLS (ordinary least square) method respectively reveals that the fitted model estimated by fixed effects and OLS (ordinary least square) method respectively explained 11.62% and 22.96% variability in the dependent variable being measured with CMPS ratio, which is not significant in depicting the relationship between bank-specific factors and change in the market of share.

The F-values of 3.8439605 and 3.3524179 derived under fixed effects and ordinary least squares (OLS) models, respectively, reveal that all regressors of the two models are statistically significant when it comes to explaining fluctuations in the change in market price.

The rho value computed using the fixed effects technique, commonly known as the intra-class correlation value, of 0.3269329 demonstrates that the differences across panels account for 32.69 percent of the variability in the change in market price throughout the study period.

4.3. Model Specification Test

This section will specify the best models through some specification tests to explain the impact of bank-specific factors impact on the change in share of banks in Bangladesh properly.

4.3.1. Random Effect VS Fixed Effect (Hausman Test)

The Hausman test was used to choose between two panel analysis methodologies (Fixed Effects Model and Random Effects Model). The Hausman test has two constraints: it requires strict homogeneity of the error term and assumes that the variances of idiosyncratic error and unobserved effects are constant. The hypothesis regarding this test is that H_0: Difference in coefficients,

Table 4: Output of coefficients of models (Random effect [RE], Fixed effect [FE], generalized least square [GLS] and pooled ordinary least square [OLS])

Dependent variable (CMPS)	Estimation of models			
Explanatory variables	Fixed effect (FE)	Random effect (RE)	Pooled OLS	Generalized Least Square (GLS)
Book to Market Value Ratio	−0.1398001	−0.16854085*	−0.16854085*	−0.16854085*
Return on Equity	−1.8740573	−1.21765	−1.21765	−1.21765
Price/Earnings to Growth Ratio	0.0001253	0.0001307	0.0001307	0.0001307
Cash Flow Per Share	−0.0037749	−0.0041325	−0.0041325	−0.0041325
Debt-Equity Ratio	0.0257408	0.0273947	0.0273947	0.0273947
Earnings Per Share	0.0371445	−0.0091233	−0.0091233	−0.0091233
Dividend Per Share	0.0544729	0.077419	0.077419	0.077419
Bank Size	0.29956884**	0.31921861***	0.31921861***	0.31921861***
Institutional Ownership Percentage	−0.5567007	0.014613	0.014613	0.014613
Constant	−7.91223**	−8.5087368***	−8.5087368***	−8.5087368***
N	100	100	100	100
R2	0.1162		0.2296	
F	3.8439605		3.3524179	
rho	0.3269329	0		
sigma_u	0.208783	0		
sigma_e	0.2995678	0.2995678		
Chi-square		30.171761		33.524179

Source: Authors' self-contribution based on output developed by STATA 12.0, Note: *, **, *** indicate level of significance at 5%, 1% and 0.1% respectively

not systematic means Random Effects Model is better than Fixed Effects Model and H1: Fixed Effects Model is better than Random Effects Model. Table 5 shows the result of the analysis of the Hausman test. The result showed that P-value =0.4505 which is more than 5% indicates that the Null Hypothesis cannot be rejected; indicates that Random Effects Model is better than the Fixed Effects Model.

4.3.2. Random Effect VS Pooled OLS (Breusch and Pagan Lagrangian Multiplier Test)

The BPLM test is used to compare Random Effect and Pooled OLS models. The null hypothesis states that there is no significant difference between units since the variation between estimates is zero. Table 6 shows that the study has a P-value is 1.0000 which is not statistically significant and thus the null hypothesis cannot be rejected, suggesting there is no significant difference between units and Pooled OLS method generates better estimates than the Random Effect method.

4.4. Diagnostic Test

Several diagnostic tests have been conducted in this section to verify the models.

4.4.1. Cross-sectional dependence test

In determining the impact of bank-specific characteristics on the change in share price of banks, it determines if the variance of a regression's errors is impacted by the values of the independent variables. This test considers the null hypothesis (H0) is residuals across entities are not correlated or that there is no cross-sectional dependence. The output is shown in Table 7 that the Chi-square value is 140.585 with a P-value of 0.0000 which is <5%. So null hypothesis would be rejected indicating that entities are correlated or there is cross-sectional dependence.

4.4.2. Test of autocorrelation

To examine whether the models suffer from the 1st order autocorrelation problem, Wooldridge (2002) test has been conducted to check the autocorrelation problem in the above-mentioned models. This test assumes the null hypothesis as, H0: no first-order autocorrelation which means no positive or no negative auto-correlation. The output of 1st order autocorrelation has been shown in Table 8.

As the F-value is 17.962 at a 5% significant level, which is significant as the P-value is 0.0022 which is less than 5%; so the null hypothesis is rejected and can conclude that the model suffers from 1st order autocorrelation problem.

4.4.3. Test of heteroskedasticity

The Chi-square value is 38.76 with a P-value of 0.0000, which is statistically significant and the null hypothesis of holding constant error variance is rejected, suggesting that the fixed-effect model suffers from the problem of non-constant error variance, as shown in Table 9.

4.4.4. Test of multicolinearity

The variance inflation factor, or VIF, is used to assess multicollinearity in multiple regression variables. The ratio of total model variance to variance in a single independent variable model is defined as the VIF for a regression model variable. This ratio is determined for each independent variable, with a high VIF suggesting a high degree of collinearity between the linked independent variables in multiple regression models. The higher the VIF value, the less reliable the model. If a variable's VIF value is >5, it is causing a multicollinearity problem.

Table 10 shows that in this analysis Return on Equity has the highest VIF value which is 2.97. But the mean VIF of the overall model is 1.71, which is less than 5. As a result, the model has no multicollinearity issues.

4.4.5. Test of unit-root

Unit-root test has been conducted in order to see whether the variance, covariance and mean of the panel data are stationary

Table 5: Summary result of hausman test

Variables/Statistics	Coefficients			
	(b) FE	(B) RE	(b-B) Difference	SE
Book to Market Value Ratio	−0.1398001	−0.1685408	0.0287407	0.0418696
Return on Equity	−1.874057	−1.21765	−0.6564074	0.6103357
Price/Earnings to Growth Ratio	0.0001253	0.0001307	−5.35e–06	0.0000308
Cash Flow Per Share	−0.0037749	−0.0041325	0.0003576	0.0009307
Debt-Equity Ratio	0.0257408	0.0273947	−0.001654	0.0140361
Earnings Per Share	0.0371445	−0.0091233	0.0462678	0.0257906
Dividend Per Share	0.0544729	0.077419	−0.0229461	0.029268
	0.2995688	0.3192186	−0.0196498	0.0626104
Institutional Ownership Percentage	−0.5567007	0.014613	−0.5713137	0.3236056
Chi Square	7.83			
Prob>chi2	0.4505			

Source: Based on the output generated from Stata 12.0

Table 6: Summary result of BP-LM test

Breusch and pagan lagrangian multiplier test for random effects		
cmps[Banks, t] = Xb+u[Banks] + e[Banks, t]		
Estimated results:	**var**	**sd =√(var)**
CMPS	0.1085003	0.3293939
e	0.0897408	0.2995678
u	0	0
Test: Var (u)	0	
Chi-square value	0.00	
Prob>chibar2	1.0000	

Source: Based on the output generated from Stata 12.0

or not. For this reason, Levin-Lin-Chu unit-root test has been conducted. Here the hypothesis is:

H_0: The panel contains Unit Root or is non-stationary.

H_1: The panel is stationary.

Here null hypothesis H_0 will be rejected when the P-value of the specific variable will be less than the significance level and conclude that the variable is stationary. H0 will not be rejected when the P-value is greater than and equal to P-value.

From Table 11, showing the results of the unit root test it is seen that the Adjusted t* value of the dependent variable Change in Market Price Per Share is −6.3504 which is significant at the 5% level and thus the study has to reject H0 and inferring that the panel data for CMPS is stationary or it does not contain unit-roots.

From the Table 11, it is also evident that the adjusted t-values of independent variables namely Book to Market Value Ratio, Return on Equity, Price/Earnings to Growth Ratio, Cash Flow Per Share, Earnings Per Share, Dividend Per Share, Bank Size and Institutional Ownership Percentage are significant at 5% level. Thus the null hypothesis is rejected and can conclude that the independent variables are stationary.

On the other hand, Debt-Equity Ratio has non-significant P-value of the adjusted t values, so the study failed to reject the null hypothesis and this variable contain a unit root.

5. DISCUSSION

Using a strongly balanced panel dataset, this study conducted an empirical analysis of the core factors that have a significant impact on the share price of 10 commercial banks listed in DSE in Bangladesh from 2011 to 2020. A multiple regression analysis estimated by four different regression models was tested to determine the effects of bank-specific variables on the stock price of banks. The Change in Market Price Per Share (CMPS) which is the stock's market value fluctuation rate used as the dependent variable. Following a thorough literature review, some selected bank-specific factors were considered as the study's independent variables. Of the four estimated models, the GLS was the best-fitted model which better describes the impact of bank-specific variables on the change in stock price.

According to the model specification test, The Hausman Test refers that Random Effects model is the best fiited model. On the other hand, Breusch and Pagan Lagrangian Multiplier Test refers that in between Random effects and Pooled OLS Method, Pooled OLS method is the best one. So for this analysis Pooled OLS method is the best fitted method. However, the diagnostic test infers that the model suffers from Heteroskedasticity and 1st order Auto correlation problem. So, in order to remove this problems the GLS method has been conducted assuming no Heteroskedasticity and autocorrelation problem.

According to the results of multiple regression analysis by GLS model, while examining the bank-specific factors, DSE listed Banks' Bank Size has a significant positive influence on the change in banks' stock price estimated under fixed effect, random effect, Pooled OLS and GLS method at 0.1% significance level. The underlying reason behind this is that the size of the bank affects the stock price, the greater the assets owned by the bank the higher the stock price. The ability of banks to manage bank assets will provide confidence to investors so that stock prices will rise and same as for the change in stock. This was supported by Wadud (2017), Rjoub et al., (2017), Raj and Dalvadi (2020), Nurfauzi et al., (2020).

Further Book to Market Value Ratio has found highly significant at 5% level and has negative influence on the banks' change in stock price estimated under random effects, Pooled OLS and GLS method. As this ratio measures the market value of a bank relative to its actual worth. A ratio above 1 indicates an undervalued share which means that the stock price of a company is trading for less than the worth of its assets, the share is trading cheaply in the

Table 7: Output of Breusch-Pagan LM test of independence

	e1	e2	e3	e4	e5	e6	e7	e8	e9	e10
e1	1.0000									
e2	0.2208	1.0000								
e3	0.1661	0.6690	1.0000							
e4	−0.0253	0.8206	0.6163	1.0000						
e5	0.1838	0.6246	0.3506	0.4719	1.0000					
e6	0.3254	0.8584	0.8600	0.6895	0.5490	1.0000				
e7	0.0814	0.7835	0.7957	0.8516	0.4297	0.7826	1.0000			
e8	0.7229	0.2908	0.3960	−0.0198	0.0124	0.3261	0.1610	1.0000		
e9	−0.1018	0.8427	0.5928	0.9429	0.4932	0.6783	0.8728	−0.0017	1.0000	
e10	0.6350	0.3553	0.6004	0.4239	0.1087	0.4756	0.6109	0.6718	0.3475	1.0000

Breusch-Pagan LM test of independence: chi2 (45) = 140.585, Pr=0.0000

Source: Authors' self-contribution based on output developed by STATA 12.0

Table 8: Output of wooldridge test for autocorrelation

Wooldridge test for autocorrelation in panel data	
Null hypothesis, Ho: There is no first order autocorrelation	
F-value (1, 9)	17.962
P-value	0.0022

Table 9: Output of modified wald test for group-wise heteroskedasticity

Modified Wald Test for group Heteroskedasticity in FE regression model	
Null hypothesis, Ho: σ2i = σ2 for all i	
Chi-square (10)	38.76
P-value	0.0000

Source: Based on the output generated from Stata 12.0

Table 10: Output of variance inflation factor

Variables	VIF	1/VIF
Return on equity	2.97	0.336187
Earnings per share	2.36	0.424137
Book to market value ratio	1.89	0.529903
Bank size	1.47	0.678948
Debt-equity ratio	1.37	0.729250
Institutional ownership percentage	1.30	0.768110
Cash flow per share	1.28	0.778327
Price/earnings to growth ratio	1.06	0.940530
Mean VIF	1.71	

Source: Based on the output generated from Stata 12.0

Table 11: Results of unit root test (LLC)

Variables	Adjusted t*	P-value	Stationary
Change in Market Price Per Share	−6.3504	0.0000	Yes
Book to Market Value Ratio	−3.7621	0.0001	Yes
Return on Equity	−3.0222	0.0013	Yes
Price/Earnings to Growth Ratio	−7.0805	0.0000	Yes
Cash Flow Per Share	−8.7790	0.0000	Yes
Debt-Equity Ratio	−0.1983	0.4214	No
Earnings Per Share	−4.7789	0.0000	Yes
Dividend Per Share	−5.0219	0.0000	Yes
Bank Size	−3.5498	0.0002	Yes
Institutional Ownership Percentage	−2.3077	0.0105	Yes

Source: Based on results generated by STATA 12.0

market compared to its book value. A ratio below 1 indicates that the bank is increasingly successful in creating value for shareholders and the amount of profit to shareholders will increase so that investors will be interested in investing their funds into the firm and thus the share price will increase. Thus this implies an inverse relationship with the dependent variable which is also supported by Arshad et al., (2015), Khan (2012) and Wadud (2017). The other bank-specific variables namely Return on Equity, Price/Earnings to Growth Ratio, Cash Flow Per Share, Debt-Equity Ratio, Earnings Per Share, Dividend Per Share, Bank Size and Institutional Ownership Percentage were not found significant in explaining the fluctuation in the change in market price per share.

6. CONCLUSION

The study's major objective was to determine how various bank-specific factors affected the stock prices of Bangladeshi banks listed on the DSE. The study attempted to bridge the gap by including various bank-specific factors namely Book to Market Ratio, Return on Equity, Price/Earnings to Growth Ratio, Cash Flow per Share, Debt to Equity Ratio, Earnings per Share, Dividend per Share, Bank Size and Institutional Ownership Percentage. Multiple regression analysis was used, with several econometric models estimated using Fixed effects, Random effects, GLS, Pooled OLS and Cross-sectional GLS approaches. According to the estimated outputs of the regression models by GLS method as it is the best fitted model here, only Bank Size and Book to Market Value explanatory variables are found significantly responsible for fluctuation in the change in share price of banks, contributing to the current literature by revealing the importance of bank-specific factors that include all metrics in their calculation. More specifically, Book to Market Value Ratio has been found significant negative impact on the change in market price per share. On the other hand Bank Size has significant positive impact in explaining the impact of the bank-specific variables on the change in share price of banks. As a result, Bangladesh's DSE-listed banks should take appropriate measures to boost their stock values, such as attempting to improve the ratio that has a positive impact on the share price while decreasing the ratio that has a negative impact. Listed banks should increase their earnings ratios in line with other industries, improve asset quality and reduce NPL rates through excellent credit management, increase dividend prospects

and strive to improve employee skills to increase productivity, reduce costs and increase earnings.

To conclude, if the unfavorable indicators can be overcome by implementing the recommended policy implications, the share price of Bangladesh's listed banks will rise and follow a stable trend. Future research should look at other variables like inflation rate, money supply, DSE index, remittances and so on over a longer period.

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