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Impact of Dividend Policy on Stock Price Volatility: An Empirical Study on Financial Service Industry of Bangladesh

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Abstract

The impact of dividend policy on stock price volatility is one of the most researched topics of corporate finance. This study investigates the relationship between stock price volatility and dividend policy among Bangladeshi financial service industry companies. Two key variables - dividend yield and dividend payout have been taken as the independent variables after controlling for firm size, asset growth, earnings volatility, long-term debt, and earnings per share. The stock price volatility has been taken as the dependent variable. Panel regression analysis is employed to explore the relationship of dependent with independent variables. Results reveal a significant positive relationship between stock price volatility and dividend yield among companies considered in this study. This study will help regulators and investors understand how the stock price fluctuates in response to financial information such as dividend announcements.

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1.0 Introduction

Dividend policy, one of the tools of corporate finance strategy, has been remaining as a bone of contention in the field of corporate finance amongst corporate financial managers and researchers over the past half-century. The main purpose of financial management is the maximization of shareholders' wealth with a clear balance in three core decisions namely, investment, financing, and dividend decisions. Dividend decisions, being the basis for dividend policies, cover many critical corporate concerns like clientele effect, agency cost, and share assessment (Zakaria et al., 2012). Paramount connotation on defining the appropriate dividend policy of a corporation has been becoming a vital issue increasingly due to the stockholder's wealth magnification and diverse preferences of market participants.

Dividend policy refers to the strategy of selecting the amount or percentage of dividend disbursement and profit retention. A firm utilizes it to formulate how much it will disburse to the shareholders as dividend or how much it will preserve for reinvestment. The selection of a suitable dividend policy for a company is an enormously notable decision for the management and owners of the company. On the other hand, stock price volatility is the systemic risk encountered by the investors who hold ordinary shares (Guo, 2002). Shareholders are inherently risk-averse. Therefore, investors must measure the stock price movements resulting from the company's dividend policy as it influences their decisions toward earnings from the investment. The wise investment will contain a lesser amount of risk (Kinder, 2002).

The capital market of Bangladesh is mostly equity-based and can be classified as a frontier market that is less established, less accessible, and riskier than emerging markets. It is worth mentioning that the stock market of Bangladesh is also speculative in nature due to the existence of information asymmetry capital gains are typically sought particularly by individual investors. Institutions and long-term investors give due concern to the dividend policies of companies. Stock price movements and dividend policies are significantly affected by the level of information risk (Hossin and Ahmed, 2020). Consequently, investors require paying close consideration to their dividend returns and the riskiness of their investments. In this connection, this research is an attempt to discover the impact of dividend policy on stock price volatility with a particular focus on the financial service industry of Bangladesh. The justification for considering this industry is that it offers the scope to explore the dividend policy of commercial banks and non-bank financial institutions (NBFIs) listed in the Dhaka Stock Exchange (DSE) that will subsequently allow the assessment of the upcoming dissimilarity with the rest sectors of Bangladesh.

A plethora of academicians have attempted to explore the relationship between dividend policy and stock price volatility but found contradictory outcomes and yet there is no identical and concrete explanation about the effect of dividend policy on stock price volatility among the researchers. This phenomenon is termed the "dividend puzzle" in finance literature (Black, 1976). The absence of unanimity between the earlier scholars and the prominence of the subject inside the ground of corporate finance offers a platform for the authors to explore this similar study. Due to the information content nature of dividend in the marketplace, dividend policies of banks and NBFIs may be anticipated to vary from those of other bodies (Bessler and Nohel, 2000), due to the customs and institutional structures of the respective nation (Ashraf and Zheng, 2015; Esteban and Pérez, 2001; Lepetit et al., 2017; Zheng and Ashraf, 2014). This reason also provides the authors a ground to reconnaissance the dividend policy of commercial banks and NBFIs.

This study endeavors to specify the legitimacy of two hypotheses – Hypothesis I: Dividend policy of a financial service company has a significant impact on the stock price volatility of that company in Bangladesh; Hypothesis II: If dividend policy has a significant impact on stock price volatility, the effects will be greater between some particular dividend policy proxy and the other risk and profitability measures. The hypotheses are developed based on a rigorous literature evaluation to achieve the aforesaid objective. We employ panel regression analysis to establish the extent to which dividend policies of firms in the financial service industry affect their share price. The study finds a noteworthy positive relationship between stock price volatility and dividend yield, one of the representations of dividend policy.

This study will contribute by providing substantial intuitions to the policymakers and investors of the financial service industry of Bangladesh especially in the banks and NBFIs for a better understanding regarding the impact of dividend policy on stock price volatility and for the formulation of dividend policy strategies.

Literature Review and Theories of Dividend Policy

Dividend policy remains a source of controversy despite years of theoretical and empirical research, including one aspect of dividend policy: the linkage between dividend policy and stock price volatility. Paying large dividends decreases risk and thus influences stock price

(Gordon, 1963) as well as is a proxy for future earnings (Baskin, 1989). A number of theoretical mechanisms have been suggested that cause dividend yield and payout ratios to vary inversely with common stock volatility.

Baskin (1989) developed a remarkable and highly acclaimed method to examine the relationship between dividend policy and stock price volatility. He progressed with four rudimentary models which connected dividends to stock price volatility and termed these – the duration effect, rate of return effect, arbitrage pricing effect, and information effect. The Duration effect indicates that high dividend yield stocks are less sensitive to discounts rates because it includes more close-term cash flows. The author used the Gordon growth model for demonstrating this effect. On the other hand, the rate of return effect proposes that companies with low dividend yields and low payout will be assessed more valuable than their assets in place due to their growth opportunities. The firm can invest more effectively than an individual investor, which grows anticipation about high upcoming profit from the investment prospects. If the potentials of the investor about profit are not met, it will tend to have more share price fluctuations. Arbitrage realization effect is another mechanism that claimed that the financial market is inefficient considerably, which means that mispricing is possible. The investor who detects the mispricing and projected dividend over subsequent periods is concerned about the return over the following periods. Again, information effect states information transmission to the capital market through the dividend policy of the firm. All these aspects play a catalyzing role to create share price volatility.

The corporate finance literature shows that several studies are done on different developed and developing economies to examine the relationship between dividend policy and stock price movements. Linter (1956) was one of the earliest researchers of the effect of dividend policy on share price fluctuations. By interrogating the management of 28 corporations, the outcome of his research pointed out that dividend payout can affect the firms' market value. Subsequently, Baskin (1989) analyzed 2,344 American firms over the period from 1967 to 1986 and revealed a significant negative correlation between dividend yield and stock price volatility. He also mentioned that dividend policy can be utilized for controlling the share price volatility and reported that if dividend yield rises by 1%, the annual standard deviation of stock price movement falls by 2.5%.

Contrary to the study of Baskin (1989), the scholars – Allen and Rachim (1996), in their study on the Australian stock market, discovered no relationship between the stock prices and dividend yield by applying cross-sectional multiple regressions. They also found a significant negative association between stock price volatility and dividend payout. They added that control variables such as size, earnings volatility, and leverage describe the relationship with stock price volatility.

Nazir, et al. (2010) and Suleman, et al. (2011) studied the stocks of the Karachi Stock Exchange (KSE) and observed the association between dividend policy and stock price volatility in Pakistan extracting data for the period 2003 to 2008 and 2005 to 2009 respectively. The result of Nazir et al., (2010) was in line with Baskin's (1989) findings regarding the stock price volatility's favorable association between dividend yield and dividend payout. But Suleman, et al. (2011) found that stock price volatility has a significant positive relationship with dividend yield contrary to Baskin's (1989) results. They also reported a significant negative relationship between stock price volatility and growth.

In a study on 123 companies from a UK perspective, Hussainey et al. (2011)

examined the relationship between stock price volatility and dividend policy from 1998 to 2007. Their work was founded on Baskin, 1989 which highlighted that share price is affected and fluctuated by a firm' earnings, growth rate, and level of leverage. However, their findings demonstrated a significant adverse relationship between share price volatility and payout ratio linking with the outcomes of Allen and Rachim, 1996.

Again, moving from developed to developing and emerging economies, we found several supplementary shreds of evidences subject to this study. With respect to China as an emerging economy of the world, Chen et al. (2009) analyzed the effect of the cash dividend on stock prices from 2000 to 2004. They came up with the outcome of a substantial optimistic correlation between cash dividend and stock price movements. Apart from using normal control variables (size, growth, debt), they incorporated earnings per share (EPS) in their study and concluded that there is a major positive correlation between EPS and stock price fluctuations.

In another study conducted by Hashemijoo et al. (2012) on the stocks of the Malaysian Stock Exchange also revealed a negative correlation between price volatility with both variables of the dividend policy, and dividend yield, as well as firm size, has the highest significant effect on the stock volatility. However, Abdul Rahim, et al. (2010) identified a positive affiliation between dividend policy and the firm value based on 361 non-financial Malaysian listed firms from 2002 to 2007. They also added that underinvestment, increased dividend, and stationary debt ratio will increase the value of the firm.

Finally, shedding light on the studies from Bangladesh's perspective, a few reviews have been identified in previous literature. Rashid and Rahman (2008) steered a study on 104 non-financial firms registered in the DSE from 1999 to 2006. Their study revealed that there is an insignificant positive relationship between share price volatility and dividend policy. Masum (2014) empirically measured excess stock market returns of 30 listed banks from 2007 to 2011 using a panel data approach. He came up with a result of a significant positive association between dividend policy and stock prices. These results founded by Rashid and Rahman, 2008, and Masum, 2014 contradicted Baskin, 1989. The inconsistency could be due to the dissimilar atmospheres of the two countries.

A number of dividend theories exist that attempt a clarification of the impact of corporate dividend policies on stock prices. Among numerous dividend theories; dividend irrelevance theory, agency cost theory, bird-in-the-hand theory, dividend signaling theory, and clientele theory are mentionable.

In a perfect market with no taxes, no transaction costs, and any other market imperfections; Miller and Modigliani (1961) developed dividend irrelevance theory. According to this theory, dividends are irrelevant and the dividend policy does not affect the shareholders' value. However, agency cost theory is contrary to the assumptions of dividend irrelevance theory. Ross et al. (2008) define the agency cost as the cost of the conflict of interest between shareholders and management. Two agency costs have been detected by Easterbrook (1984); the cost of observing management and the cost of risk aversion from the side of managers. Another conspicuous theory is the bird-in-the-hand hypothesis which postulates that dividends are valued differently from retained earnings (capital gains) in a world of uncertainty and information asymmetry. Al-Malkawi (2007) asserts that a bird in hand; (dividend), is worth more than two in the bush; (capital gains). Again, due to uncertainty of future

cash flow, investors often tend to prefer dividends to retained earnings. In the case of dividend signaling theory, a future projection of the firm is influenced by the information content nature of dividend announcements (Bhattacharya, 1979; Pathirawasam, 2009; Dissabandara and Perera, 2010). Petit (1972) also experimented that the amount of dividend paid appears to carry great information about the prospects of a firm to the investors with asymmetric information; this can be proven by the movement of the share price. Finally, clientele theory can be clustered by two factors; tax effects and transaction cost (Al-Malkawi, 2007). The word clientele is an amalgamated name used for clients and customers collectively. Investors in the upper tax bracket would prefer retained earnings or capital gain in the form of stock price improvements on dividend, while investors in the lower tax bracket might prefer dividend on retained earnings in the form of stock price improvements.

Data Source & Sample

Secondary data have been used in this study. All of the necessary data is collected from the websites of the respective commercial banks and financial institutions, as well as their annual reports. There are 30 commercial banks and 23 financial institutions currently listed under the bourse. Sixteen commercial banks and 11 financial institutions were selected that constitute about 65% of the market capitalization of the financial service industry including commercial banks and NBFIs. Data are collected for the years 2014 to 2019. The raw data were used to perform some calculations to obtain the suitable variables required for this study. The research is premised on the theoretical framework as created by Baskin (1989) and Allen & Rachim (1996). However, this research is different from that of Baskin and Allen & Rachim in some ways; i) It considers banks and NBFIs that are listed in the primary bourse of Bangladesh; ii) It includes only those banks and NBFIs that have been consistently disbursing cash dividends for at least 5 years' period; iii) It considers the recent years where most companies have paid cash dividend.

Variables Described

Considering the previous literatures the relevant variables are selected for this study. The relationship between stock price volatility and firms' dividend policy has been analyzed using 10 (ten) variables with 4 (four) major predicting variables and 5 (five) other control variables. The study considers share price volatility as a function of dividend policy. Two variables-dividend yield and dividend payout ratios are used as a proxy for dividend policy and these are the key independent variables. Baskin's (1989) study indicated that share price volatility has a negative relationship with both dividend yield and dividend payout. On the other hand, Allen and Rachim (1996)'s analysis showed a positive relationship between share price volatility and dividend yield while a significant negative linkage between dividend payout and share price volatility. Baskin (1989) also reported that size, earning volatility, debt and growth affect both share price volatility and dividend policy. As several factors influence both dividend policy and stock price volatility, the study has considered five control variables; asset growth, earnings volatility, earnings per share (EPS), long-term debt ratio, and firm size to give the model a proper fit.

Dependent Variable

Share Price Volatility: The study considers share price volatility as the dependent variable. Firstly, the monthly adjusted stock price for every year has been calculated. Then we find the high and the low share price for each respective year. To originate price volatility data, the high and low prices have been averaged and then

squared. This was averaged for all available years and a square root transformation was applied in order to obtain a variable equivalent to a standard deviation. The use of standard deviation as substitution of share price volatility is mostly for the reason that standard deviation could be affected by extreme values. Besides, our method is congruent with that of Baskin (1989), whose study forms the theoretical framework of this research. Almost all academicians used this process to get price volatility information (Hussainey et al., 2011; Nazir et al., 2010; Rashid and Rahman, 2008). Instead of using the closing and opening prices (Parkinson, 1980), this method appears to be more precise.

Independent Variables

Dividend Yield: The Dividend yield has been estimated by dividing the dividend per share by the market value per share of the company for each year. The study considers two variables of dividend yield to find the impact on stock price volatility. The Dividend yield for the respective year and dividend yield with a 1-year lag is considered to find the separate impact of a lagged variable. As investors trade shares in the market based on dividend yield expectation of the respective year and the expectation is developed based on the dividend yield received in the previous year, this procedure seems to be more rational (Camilleri et al., 2018).

Dividend Payout Ratio: The payout ratio is expressed by dividing the total amount of cash dividend paid by total earnings for the year. The payout ratio of the immediate last year and the respective year is considered separately in the study to find any lagged impact of the payout ratio. This consideration is also in line with Camilleri et al. (2018) since investors determine share prices depending on the amount of dividend received in the respective year and the amount received in the preceding year.

Firm Size (market value): We have used the natural logarithm of total asset to calculate firm size (Smith and Watts, 1992; Kouki and Guizani, 2009; Chae et al., 2009).

Earnings Volatility: In order to originate earnings volatility, at first we calculate the ratio of Earnings Before Interest and Taxes (EBIT) to total assets. Then the standard deviation of this value is used for all the years (Hussainey et al., 2011; Nazir et al., 2010; Rashid and Rahman, 2008).

Asset Growth: Asset growth rate is determined as the percentage increase or decrease in total assets from the total assets of the immediate previous year (Hussainey et al., 2011; Camilleri et al., 2018).

Long-term Debts: This control variable is considered as a proxy for operating risk and is calculated by dividing long-term debt to total assets possessed by the company (Chen et al., 2009; Camilleri et al., 2018).

Earnings per Share (EPS): Earnings per share is considered as a proxy for profitability and is calculated by dividing net income by the number of common shares outstanding at the beginning of the year (Chen et al., 2009; Shah and Umara, 2016; Hossin and Ahmed, 2020).

Table 1: Summary of Variables

Variable Type	Factors	Proxy	Data Label	Measurement	Expected Sign
Dependent Variable	Stock Price Volatility	Standard Deviation of Stock price	PV	$\sqrt{\frac{High - Low}{\left(\frac{High + Low}{2}\right)^2}}$	
Independent Variables	Dividend Yield	Dividend Yield of the present year	DY_t	$\frac{Dividend\ Per\ Share}{Price\ per\ Share}$	Negative
		Dividend Yield of the immediate previous year	DY_{t-1}	$\frac{Dividend\ Per\ Share\ pervious\ year}{Price\ per\ Share\ previous\ year}$	Negative
	Dividend Payout	Dividend Payout Ratio of the present year	PR_t	$\frac{Dividend\ Per\ Share}{Earnings\ Per\ Share}$	Negative
		Dividend Payout Ratio of the immediate previous year	PR_{t-1}	$\frac{Dividend\ Per\ Share\ Previous\ year}{Earnings\ Per\ Share\ Previous\ year}$	Negative
Control Variables	Firm Size	Natural Log of Total Assets	Size	$\ln(Total\ Assets)$	Positive
	Operating Risk	Leverage Ratio	LD	$\frac{Long - Term\ Debt}{Total\ Assets}$	Positive
	Growth	Asset Growth	AG	$\frac{\Delta\ Total\ Assets}{Total\ Assets}$	Positive
	Profitability	Earnings Per Share	EPS	$\frac{Net\ Income}{Number\ of\ Share\ Outstanding}$	Positive
	Market Risk	Earnings Volatility	EV	*Standard Deviation of (Earnings Before Interest and Taxes/ Total Asset)*	Positive

Research Methodology

Model Specification

A generalized form of the statistical model of this study can be presented as follows:

$$Y = f(P, C, \varepsilon)$$

Where the response variable measures Y = stock price volatility proxy (PV), the predictor variable measures P = dividend policy proxy variables, C = control variables (other predictor variables influencing stock price volatility), and ε = error term.

This study initially uses the following elaborated profitability equation to run a regression model:

$$Y = \alpha + \beta_1 DY_t + \beta_2 DY_{t-1} + \beta_3 PR_t + \beta_4 PR_{t-1} + \beta_5 Size_t + \beta_6 LD_t + \beta_7 AG_t + \beta_8 EPS_t + \beta_9 EV_t + \varepsilon$$

Statistical Analysis Method

To find out the legitimacy of the hypotheses of this study an Ordinary Least Squares (OLS) regression is run based on the specified regression model. Then, a stepwise model selection strategy – backward elimination process has been followed in this study to derive an even better model. The improved model is then used to perform OLS regression which is expected to produce estimations with more accuracy.

The data this study deals with are characteristically panel data that are also known as longitudinal data or cross-sectional time-series data. Panel data analysis is used to find the best-fitted regression model. All the diagnostic tests are used to find whether there are any heteroskedasticity and autocorrelation effects available in the data set. To account for contemporaneous cross-sectional correlation, group-wise heteroskedasticity, and autocorrelation, Panel Corrected Standard Errors (PCSEs) model is used.

Data Analysis

Several tests were performed on the data. The chapter includes summary statistics, correlation matrix, OLS regression, and diagnostic tests for assessing the overall quality of the data or model, like - test for multicollinearity and heteroskedasticity problems. With the help of backward elimination, a comparatively less complex model is derived that yields better estimation results. And with only those limited independent variables, the panel data analysis has been conducted. This includes the fixed-effects and random-effects model as well as the Hausman specification test for choosing the best model to run an estimate for the data. Tests for group-wise heteroskedasticity, cross-sectional dependence, and autocorrelation were conducted as well, and finally, to account for all those problems, a PCSEs model was run to get to the ultimate estimate results of the study.

Summary Statistics

Table 2: Summary Statistics

Variables Name	Number of Observations	Mean	Std. Dev.	Min	Max
PV	135	0.1338795	0.0450709	0.027061	0.2682766
DY	135	0.051966	0.0348134	0.000000	0.1744186
DY_{t-1}	135	0.0463769	0.0380662	0.000000	0.1744186
PR	135	0.486105	0.3817355	-1.785714	2.047005
PR_{t-1}	135	0.4345417	0.4098409	-1.785714	2.047005
Size	135	25.48979	1.217732	22.900750	27.76336
LD	135	0.3778724	0.1771998	0.005604	0.7218778
AG	135	0.1237191	0.0999589	-0.184106	0.3882885
EPS	135	3.2470210	2.5268710	-3.479694	15.100000
EV	135	0.0049202	0.0051965	0.000097	0.0328001

The table above shows the summary statistics of the variables of the study. The control variable – Size has the largest standard deviation among all the variables. The typical dividend yield (DYt) for the banks was 5.20%. The dividend payout ratio (PRt) was on average 48.61% of total yearly net income. Earnings per share (EPS) ranged from -3.47 to 15.1. The average long-term debt to total asset (LD) ratio was 37.8%.

Correlation Matrix
Table 3: Correlation Matrix

	PV	DY_t	DY_{t-1}	PR_t	PR_{t-1}	*Size*	*LD*	*AG*	*EPS*	*EV*
PV	1									
DY_t	0.3130* (0.0002)	1								
DY_{t-1}	0.1455 (0.0923)	0.2495* (0.0035)	1							
PR_t	0.1671 (0.0527)	0.5060* (0.0000)	0.0583 (0.5019)	1						
PR_{t-1}	-0.0419 (0.6291)	0.0148 (0.8643)	0.5859* (0.0000)	0.1863* (0.0305)	1					
Size	-0.0586 (0.4999)	0.1705* (0.048)	0.2498* (0.0035)	-0.2705* (0.0015)	-0.1167 (0.1776)	1				
LD	0.1746* (0.0428)	0.0501 (0.5642)	0.0943 (0.2766)	-0.1403 (0.1046)	-0.0965 (0.2657)	0.2817* (0.0009)	1			
AG	-0.1215 (0.1604)	0.0389 (0.6545)	0.1474 (0.088)	0.0620 (0.4748)	0.1024 (0.2372)	0.0187 (0.8295)	0.2140* (0.0127)	1		
EPS	-0.7259* (0.0000)	-0.1373 (0.1122)	-0.0833 (0.3371)	-0.1482 (0.0862)	-0.0929 (0.2839)	0.1815* (0.0351)	-0.0841 (0.3321)	0.1225 (0.1568)	1	
EV	0.1056 (0.2228)	-0.4064* (0.0000)	-0.2690* (0.0016)	-0.1620 (0.0605)	-0.0936 (0.2802)	-0.4488* (0.0000)	-0.2474* (0.0038)	-0.3257* (0.0001)	-0.2264* (0.0083)	1

** Significant at 5% level*

The dependent variable stock price volatility (PV) has a positive correlation with the dividend yield of the current year (DYt) and a weaker positive correlation with the dividend yield of one-year lag (DYt-1) though the expected result is of a negative correlation. The dependent variable (PV) also shows a positive correlation with the payout ratio of the current year (PRt) but a negative correlation with the payout ratio of one-year lag (PRt-1). The strongest of all relationships here is the stock price volatility (PV) and earnings per share (EPS) which shows a strong negative correlation. This means that the stock price volatility reduces with the increase in earnings per share by the companies and vice versa. The other control variables of size (Size), long-term debt to asset ratio (LD), and asset growth (AG) show a weak negative correlation with stock price volatility (PV).

Model Specification

The initial OLS model, considering all the independent variables, produces less accurate estimates. Some of the independent variables show lesser and insignificant predictive power on the dependent variable. So, a stepwise model selection strategy is used for robust model development considering the adjusted R-squared values.

Table 4: Comparison among Different OLS Models

Variables	Initial OLS PV	Model 2 PV	Model 3 PV	Model 4 PV	Model 5 PV
DY_t	0.264** (0.0986)	0.271** (0.0839)	0.274** (0.0836)	0.280** (0.0832)	0.233** (0.0756)
DY_{t-1}	0.210* (0.093)	0.208* (0.0918)	0.189* (0.0865)	0.186* (0.0863)	0.172* (0.0859)
PR	0.00118 (0.00869)				
PR_{t-1}	-0.0214* (0.00836)	-0.0212* (0.00818)	-0.0196* (0.00778)	-0.0200* (0.00776)	-0.0206** (0.00777)
Size	-0.00154 (0.00273)	-0.00166 (0.00256)			
LD	0.029 (0.0157)	0.0288 (0.0155)	0.0268 (0.0152)	0.0248 (0.015)	0.0191 (0.0144)
AG	-0.0267 (0.0277)	-0.0266 (0.0275)	-0.023 (0.0269)		
EPS	-0.0118*** (0.00109)	-0.0118*** (0.00109)	-0.0119*** (0.00108)	-0.0120*** (0.00107)	-0.0125*** (0.001)
EV	0.52 (0.661)	0.509 (0.653)	0.662 (0.607)	0.79 (0.588)	
_cons	0.186* (0.0716)	0.190** (0.0666)	0.148*** (0.0124)	0.145*** (0.012)	0.156*** (0.00872)
N	135	135	135	135	135
R-sq	0.616	0.616	0.614	0.612	0.607
adj. R-sq	0.588	0.591	0.593	0.594	0.591
rmse	0.0289	0.0288	0.0288	0.0287	0.0288

Standard errors in parentheses

** p<0.05, ** p<0.01, *** p<0.001*

The table above is the summary output of the step-by-step backward elimination strategy used in this study to find out the best model that yields the most accurate estimates. At stage 1 of the elimination process, the exclusion of the variable – the payout ratio of the present year (PRt) yields the highest adjusted R-squared value of 0.591. After excluding Size, the second stage of the exclusion process is conducted. At this stage, eliminating the variable – firm size (Size) improves the

adjusted R-squared the most, yielding a value of 0.593. Then in the third stage, another control variable – Asset growth (AG) is excluded to improve the adjusted R-squared value to 0.594. To inspect if any more improvements of adjusted R-squared are possible, a fourth stage elimination is done. But as it appears that the adjusted R-squared does not get any better by excluding any of the remaining predictor variables.

From the comparison presented above it is evident that the model stops improving after Model 4 in terms of the significance of the predictor variables, adjusted R-squared values as well as root mean squared error. Model 4 is the optimum model to be used in this study. Excluding variables PRt, Size, and AG, the new profitability equation stands as:

$$Y = \alpha + \beta_1 DY_t + \beta_2 DY_{t-1} + \beta_3 PR_t + \beta_4 PR_{t-1} + \beta_5 Size_t + \beta_6 LD_t + \beta_7 AG_t + \beta_8 EPS_t + \beta_9 EV_t + \varepsilon$$

An improved OLS regression is run using only those variables that remain in the model after the backward elimination is deployed.

Different diagnostic tests are run to find any problem of multicollinearity and heteroskedasticity with the time series data. All the tests show the improved model after the backward elimination method has no problem of multicollinearity and heteroskedasticity in the data set.

Panel Data Analysis

Hausman Specification Test

Hausman test is conducted to pick between fixed-effects and random-effects. Here, the null hypothesis is to go for the random-effects and the alternate hypothesis is to go for fixed-effects.

Table 5: Hausman Specification Test

	Coefficients			
	(b)	(B)	(b-B)	sqrt (diag(V_b-V_B))
	fixed	random	difference	S.E.
DY	0.1374392	0.1903517	-0.0529124	.
DY_{t-1}	-0.0045588	0.0903678	-0.0949266	0.0079608
PR_{t-1}	-0.0042563	-0.0137165	0.0094603	.
LD	-0.0384858	0.0054768	-0.0439626	0.0189768
EPS	-0.0054371	-0.0094864	0.0040493	0.0011788
EV	-3.012978	-0.912954	-2.100024	0.7371212
Test: Ho: difference in coefficients not systematic				
Prob > chi2 = 0.0000				

The table above shows the output of the Hausman specification test. The p-value is significant. That is why the null hypothesis is rejected and fixed-effects are to be used.

But before jumping into that, some diagnostic tests should be conducted.

According to the diagnostic tests regarding Contemporaneous Correlation Test

(Appendix_Table 9), Group-wise Heteroskedasticity Test (Appendix_Table 10), and Autocorrelation Test (Appendix_Table 11) the data set has group-wise heteroskedasticity and autocorrelation.

To account for contemporaneous cross-sectional correlation, group-wise heteroskedasticity, and autocorrelation, Panel Corrected Standard Errors (PCSEs) model is used.

From the above regression model, it can be reasonably established that the group of predictor variables reliably estimate the response variable as the p-value associated with the F-statistic is minuscule. The R-squared value is 61.21%. So, the model is overall a good fit. All the coefficients in the model are different than zero.

Praise-Winsten Regression (PCSEs Model)
Table 6: PCSEs Regression Model

R-squared	0.6121
Wald chi2 (5)	176.36
Prob > chi2	0.0000

PV	**Coef.**	**Panel-corrected Std. Erı**	**z**	**P> |z|**
DY	0.2800776	0.0877519	3.19	0.001
DYt-1	0.1864005	0.0856763	2.18	0.030
PRt-1	-0.0199946	0.0062258	-3.21	0.001
LD	0.0247925	0.0111809	2.22	0.027
EPS	-0.0119716	0.0013328	-8.98	0.000
EV	0.7897784	0.8623667	0.92	0.360
_cons	0.1449864	0.0128835	11.25	0.000

When looked at individual predictor variables, it can be stated that the dividend yield of the present year (DYt) and the dividend yield of the last year (DYt-1) have a significant positive effect in explaining the stock price volatility (PV) of the banks and NBFIs within the study period. This means that stocks with higher dividend yields show a high level of price volatility. The payout ratio of the last year (PRt-1) of the firms also has significant negative relation with stock price volatility (PV) meaning that a higher payout ratio in the last year reduced the volatility of the stock price in the present year. Among the control variables, EPS has significant explanatory power over the dependent variable and shows a negative relationship with stock price volatility. This means that the price volatility of stocks decreases if the earnings of the companies increase. The control variable of operating risk shows a significant positive relationship and the control variable for market risk shows an insignificant positive relationship. This means that risks increase stock price volatility.

Interpretation & Findings

Both the hypotheses of this study are proved to be legitimate.

i. Dividend policy does have a significant positive effect, with high magnitude, on stock price volatility of the financial service industry in Bangladesh which is evident from the positive relationship between price volatility (PV) and dividend yield of the present year (DYt) and the dividend yield of the immediate previous year (DYt-1) of the stocks of the companies being analyzed.

ii. The other proxies for dividend policy apart from dividend yield (DY) were the payout ratio of the firms in the present year (PRt) and the payout ratio of the firms in the immediate previous year (PRt-1). The immediate previous year payout ratio of the firms (PRt-1) shows a significant negative relationship with stock price volatility but the magnitude is low. The other proxy variable did show very little explanatory power over the dependent variable (PV). So, the effects are stronger between some specific dividend policy proxy variables and stock price volatility measures but weaker between some other specific dividend policy proxy and the stock price volatility measure.

Table 7: Findings Summary

Variable Type	Factors	Proxy	Outcome	Magnitude
Dependent Variable	Stock Price Volatility	Standard Deviation of Stock price	_	_
Independent Variables	Dividend Yield	Dividend Yield of the present year	Significant, Positive	28%
		Dividend Yield of the immediate previous year	Significant, Positive	18.64%
	Dividend Payout	Dividend Payout Ratio of the present year	Insignificant	_
		Dividend Payout Ratio of the immediate previous year	Insignificant	1.99%
Control Variables	Firm Size	Natural Log of Total Assets	Insignificant	_
	Operating Risk	Leverage Ratio	Significant, Positive	2.48%
	Growth	Asset Growth	Insignificant	_
	Profitability	Earnings Per Share	Significant, Negative	1.2%
	Market Risk	Earnings Volatility	Insignificant	_

Conclusion

This study finds a causal relationship between dividend policy and price volatility of stocks of the companies in the financial service industry of Bangladesh. Conducting a panel data analysis on 16 private commercial banks and 11 NBFIs of Bangladesh for the period of 2014 to 2019, the study tries to analyze the impact of dividend policy on stock price movement. This relationship is indicated by the dividend policy proxy variables - dividend yield and payout ratio. The study finds a significant and positive relationship.

The study finds the relevance of dividend policy in stock price changes of the selected companies of the financial service industry in Bangladesh. The empirical study finds that dividend yield has a significant positive relationship with stock price volatility. This finding contradicts previous research and is unique to the companies of the financial service industry in Bangladesh. The impact of payout ratio, another dividend policy

proxy, shows a significant negative relation with stock price volatility. This outcome is contrary to the findings of Baskin (1989) but correlates with the findings of other researchers (Hussainey, et al., 2011).

Stable stock price helps to reduce the adverse price risk for the stockholders. This study can help the Bangladeshi corporate finance managers by enabling them to impact the price volatility of their stocks by altering their dividend policy. They can also control or minimize the stock price volatility by taking effective dividend policy strategies. They may be able to reduce their share price volatility by increasing their dividend payout. The study will contribute to the dividend policy strategy mechanisms under corporate finance literature by providing evidence from the DSE to the prior studies done in other developed and developing countries. If there is an uptrend in the number of companies that pay cash dividends and if those companies can be included in this research, this study will become more robust.

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Appendix

Table 18: Market Share Calculation based on Market Capitalization

Selected Companies Name (Bank & NBFI)	Market Capitalization (in Million BDT)	% of total Market Capitalization
Al-Arafah Islami Bank Ltd	21,830.50	2.96%
The City Bank Ltd.	25,206.39	3.41%
Dhaka Bank Ltd	10,302.53	1.39%
Dutch-Bangla Bank Ltd.	33,715.00	4.56%
Eastern Bank Ltd.	28,818.88	3.90%
Export Import Bank Ltd.	14,969.86	2.03%
Islami Bank Bangladesh Limited	41,859.76	5.67%
Jamuna Bank Ltd.	12,811.76	1.73%
Mercantile Bank Ltd.	12,103.40	1.64%
National Credit and Commerce Bank Ltd.	12,675.42	1.72%
One Bank Limited	8,764.93	1.19%
Prime Bank Ltd.	16,984.25	2.30%
Pubali Bank Ltd	24,781.89	3.36%
Trust Bank Limited	19,942.18	2.70%
United Commercial Bank Ltd.	17,288.80	2.34%
Uttara Bank Limited	11,996.39	1.62%
Bay Leasing & Investment Limited	3,479.95	0.47%
Delta Brac Housing Finance Corp. Ltd.	14,273.60	1.93%
Investment Corporation Of Bangladesh	80,339.81	10.88%
IDLC Finance Ltd.	25,488.63	3.45%
Islamic Finance & Investment Ltd.	2,469.75	0.33%
LankaBangla Finance Ltd.	19,613.73	2.66%
National Housing Fin. and Inv. Ltd.	3,873.73	0.52%
Phoenix Finance and Investments Ltd.	3,598.88	0.49%
Prime Finance & Investment Ltd.	3,220.41	0.44%
United Finance Limited	2,881.57	0.39%
Uttara Finance and Investments Limited	5,732.59	0.78%
Total	**479,024.57**	**64.86%**
Sector Total	**738,583.44**	

Source: Dhaka Stock Exchange, Author Calculations

Table 9:2 Cross-Sectional Independence (Pesaran's Test)

Pesaran's test of cross-sectional independence = 30.368, Pr = 0.0000

Null: No contemporaneous correlation exists

Table 10:3 Group-wise heteroskedasticity (Modified Wald Test)

Modified Wald test for group-wise heteroskedasticity in fixed effect regression model
chi2 (13) = 354.22

Prob > chi2 = 0.0000

Null: No group-wise heteroskedasticity exists

Table 11:4 Autocorrelation Test (Wooldridge Test)

Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
F (1, 12) = 7.212
Prob > F = 0.0124

Null: No autocorrelation in the panel data