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Macroeconomic and Firm-Specific Determinants of Stock Price Volatility Before and After COVID-19: Evidence from the Pharmaceutical and Chemical Sectors of DSE

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Abstract

Due to its function of facilitating capital formation, allocation of resources, and investment decisions, the stock market plays a crucial role in economic development. Investors, policymakers, and financial practitioners all require some knowledge of the determinants influencing stock price volatility. This study aims to analyze the macroeconomic and firm-level variables affecting stock price volatility of companies in the Bangladeshi pharmaceutical and chemical sector during the pre- and post-COVID-19 periods, covering 2016-2019 and 2021-2024. The study uses data from 19 out of the 34 listed pharmaceutical and chemical companies on the DSE. The study utilizes panel data analysis and random effects model (as per the Hausman test), considering annualized stock price volatility as the dependent variable, whereas independent variables are return on equity (ROE), directors' holdings (DH) percentage, debt-to-equity (D/E) ratio, inflation rate, and GDP growth rate. Diagnostic and statistical tests confirm the robustness of the findings. The results reveal significant variations in volatility drivers across the two periods, with remarkable influences from macroeconomic instability and financial disruptions. The findings of the study have significant implications for policy-makers and investment decision-makers by identifying period-specific volatility drivers that aid in the formulation of adaptive policies, improve stability in the market, and inform sound investment decisions.

Keywords: Dhaka Stock Exchange, Macroeconomic factors, Firm specific factors, Panel data analysis, Random effects model.

1. Introduction

As the stock market has an impact on financial stability, business investment, and capital allocation, it is one of the most significant components of economic growth. Therefore, information on stock price volatility is crucial for investors and policymakers since it affects their investment decisions and market efficiency.

The pharmaceutical and chemical sectors are the industries, that are increasingly vital to Bangladesh's economy. Nevertheless, their vulnerability to both global and domestic economic disturbances, especially the COVID-19 pandemic, necessitates careful examination of variables influencing its stock price volatility. Due to increased volatility and uncertainty caused by the COVID-19 pandemic, the global financial markets have severely impacted. While some researchers (e.g., Bora & Basistha, 2021; Jelilov et al., 2020) have

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attempted to examine stock price volatility in various sectors, including in pre- and during COVID-19 situations, few studies (e.g., Mohanasundaram et al., 2024; Benson et al., 2022) have been conducted to assess stock price volatility in the pre- and post-COVID-19 period. Furthermore, most research separates either the pre-pandemic (e.g., Supriani et al., 2022) or the sudden pandemic shock (e.g., Endri et al., 2021; Chaudhary et al., 2020) and does not span the broader volatility trajectory that extends both before and after the crisis. This deficiency has been aggravated by the majority of current research (e.g., Khan & Hameed, 2023; Gautam, 2017) focusing on monetary metrics like return on equity (ROE), earnings per share (EPS), debt to equity (D/E) ratio, dividend payout ratio, and market capitalization without considering macroeconomic determinants.

Macro and firm-level variables, such as GDP growth and inflation, on one hand, and profitability and capital structure, on the other hand, are all well-documented determinants of stock prices (Alam et al., 2016). Although such determinants have been examined in various global and regional contexts, literature that explores such determinants for Bangladesh's pharmaceutical and chemical industry is rare on before and after COVID-19 periods.

This study attempts to fill these gaps by examining stock price volatility across both the pre-pandemic and post-pandemic periods, excluding the highly anomalous year 2020.The main objective of this research is to analyze the macroeconomic and firm-specific factors that affect the stock price volatility of the pharmaceutical and chemical industry in Bangladesh during the pre- and post-COVID-19 periods. Moreover, the research also helps in understanding better the risk management practices in the stock market, the formation of better policies, and the adoption of sustainable investment practices, especially in the case of the capital market of Bangladesh, which is being restructured after the impact of the COVID-19 pandemic.

2. Literature Review

The importance of stock markets to economic growth has led to a surge in research on the factors affecting their growth. Macroeconomic characteristics, which include GDP growth, inflation, exchange rates, manufacturing output, interest rates, oil prices, stock market liquidity, investment returns, and future consumption potential, and portfolio characteristics, which include return on equity (ROE), firm size, directors' holdings (DH), debt-to-equity ratio (D/E), earnings, and asset return variances, are the two main categories into which these factors are typically divided by Hassan et al. (2024). We focus on both categories to examine the volatility of DSE in this study.

Collins (1957) suggests that the main factors influencing share prices in the US are dividends, net profit, operating earnings, and book value. Hassan et al. (2024) find a strong positive correlation between the ASEAN-5 market index and the industrial production and consumer price indices. On the other hand, they show a negative relationship between interest rates and exchange rates. Khan and Hameed (2023) explore that dividend yield has no discernible impact on stock price volatility, although Dividend Per Share (DPS) and payout ratio have a significant effect on volatility. Furthermore, among companies listed in Pakistan Stock Exchange (PSX), ROE

significantly has reduced stock price volatility, whereas Earnings Per Share (EPS) and Profit After Tax (PAT) have an inverse but insignificant association with stock returns. Li et al. (2022) state that the appearance of social unrest events positively affects stock return volatility. They also conclude that there is a positive correlation between equity price volatility and macroeconomic factors, such as GDP, industrial productivity, as well as international factors, such as oil price volatility and the financialization of commodities. Dasman and Gunawan (2022) show that while inflation and economic growth have a negative effect on share price volatility, whereas trading volume has a positive effect. Conversely, they document that business size, debt, or dividend policy do not significantly affect share price volatility. Al-Rimawi and Kaddumi (2021) find that the performance of the Amman Stock Exchange (ASE) is not statistically impacted by the rates of inflation, interest rates, economic growth, and foreign investment when they are taken together. All of these factors, however, have a significant effect on the performance of the Amman Stock Exchange when they are incorporated in the model separately. The most significant factor among them is foreign investment, which is followed by shifts in the average interest rate, inflation rate, and, to a lesser degree, the pace of economic growth. Rizqia et al. (2021) examine the impact of the COVID-19 pandemic, the US stock market index, and macroeconomic factors on the growth of Indonesia's capital market and find that the COVID-19 pandemic significantly hampered the market's expansion during this time.

During the COVID-19 period, Jelilov et al. (2020) find a favorable link between inflation and stock market performance. This link has been upset by the spike in COVID-19 cases, which have increased volatility. Prior to the pandemic, a 2018 study observe a negative relationship between ASEAN stock market growth and inflation (Setiawan et al, 2019). Gautam (2017) investigates firm-specific factors that impact Nepalese banks' stock price returns and volatility and concludes that book-to-market ratio, asset growth, and earnings-price ratio have a negative effect on stock returns and volatility, while leverage, dividend payout, and dividend yield have positive effect. Alam et al. (2016) outline earnings per share, net asset value per share, price-earnings ratio, and consumer price index are the critical elements, whereas gross domestic product and interest rate spread, are considered comparatively less important elements affecting stock prices. Abdullah et al. (2016) conclude that, among eight selected pharmaceutical and chemical companies listed on the Chittagong Stock Exchange (CSE), earnings per share is positively and moderately correlated with the average share price, dividend yield has an insignificant effect, the price-earnings ratio has showed a strong positive correlation, and return on equity has showed a negative correlation with the average share price. In the investigation of relationship between macroeconomic factors and stock market volatility, Ahmad and Ramzan (2016) find that stock movements are not significantly impacted by the money supply. However, a significant association is shown between stock movements and the consumer price index, indicating that changes in inflation have an effect on stock returns. Sarbabidya and Saha (2018) find that a number of factors, including risk factors, uncertain stockholder behavior, earnings per share, political uncertainty, and uncontrollable macroeconomic conditions, have a negative impact on stock price.

There are many researches on the stock market have been conducted in examining stock price volatility. However, most of the existing studies focus on the overall stock market as well as other industries, but pharmaceutical and chemical sector is still unexplored. Furthermore, the majority of the studies have confined their analysis to only pre-COVID or COVID period without comparing the changes in volatility factors before and after the pandemic. In addition, researchers tend to put more emphasis on firm-level factors and overlook macroeconomic variables such as inflation and GDP growth, or they even study them separately instead of simultaneously. Additionally, most prior work relies on time-series data rather than panel data, which restricts their capacity to discern both the differences among firms and the changes over time. Thus, this study attempts to fill the gap in the literature by offering a sector-specific, panel-based, and comparative examination of both macroeconomic and firm-specific determinants of stock price volatility in Bangladesh before and after COVID-19.

3. Methodology

The research utilizes an integrated quantitative method to examine the effect of macroeconomic and firm-specific determinants on stock price volatility in the Bangladesh pharmaceutical and chemical sector. Given the complexity of financial market dynamics and the evolving macroeconomic landscape, a panel data regression model is used to capture market behavior. The research applies a purposive sampling method, in which selecting 19 out of 34 listed companies that maintained regular operations throughout the study period. Daily closing price related data are sourced from the DSE and Mendeley data stream. These daily closing prices are utilized to estimate annualized volatility. However, the firm-level characteristics such as Return on Equity (ROE), Directors' Holding (DH) percentage, and Debt to Equity Ratio (DER) are taken from corporate annual reports and stockanalysis.com. Macroeconomic indicators such as the inflation rate and GDP growth rate have been extracted from the World Bank Data Bank. The variables are further converted to percentage form to facilitate interpretation and comparison. The study is empirical in nature which employs the two-period approaches to differentiate between before COVID-19 and after COVID-19 market trends. The data periods cover January 03, 2016 to December 30, 2019 as the pre-pandemic period and January 03, 2021 to December 30, 2024 as the post-pandemic period.

The study omits the year 2020 because it was the most extreme outlier period with very abnormal market behavior due to the sudden outbreak of the COVID-19 pandemic. During the period, the Dhaka Stock Exchange experienced a number of price drops, contracted trading hours, setting of floor prices, transactions driven by panic, and influenced by the government interference rather than the market forces. If such an exceptional year were to be included, it would have significantly altered the stock price volatility estimation and the comparison between the before and after pandemic periods would be biased. The panel data structure offers the capability to investigate temporal and cross-sectional differences at the same time, which offers more information on the determinants of volatility. Based on the Hausman Specification Test, the study adopts a Random Effects (RE) Model to examine the relationship between stock price volatility and its determinants, which is similar to the study of Shah and

Noreen (2016). The RE model is also more favored over the fixed effects model due to the results of the Hausman test have showed that the firm effects do not correlate with the independent variables. This is efficient in terms of making the RE model, as it accommodates the inclusion of time-invariant firm attributes without consuming the degrees of freedom. Based on earlier research on the factors (Dividend policy) affecting share price volatility, such as Khan and Hameed (2023), the general equation specified for this study is as follows:

$$SPV_{it} = \beta_0 + \beta_1 ROE_{it} + \beta_2 DH_{it} + \beta_3 DER_{it} + \beta_4 INF_{it} + \beta_5 GDP_{it} + \varepsilon_{it} \quad [1]$$

where *SPV* denotes stock price volatility, and the subscript *it* refers to firm *i* at time *t*.

To test the strength and validity of the model, a series of diagnostic and statistical tests is carried out. Descriptive statistics are employed in summarizing data distribution and dispersion. Pairwise correlation coefficients and Variance Inflation Factor (VIF) statistics are estimated in order to check for potential multicollinearity among the regressors. Heteroskedasticity is tested by the Breusch-Pagan test for homogeneity of variance across observations, and the Wooldridge test for testing first-order autocorrelation that can endanger model consistency. Estimation and analysis are all conducted in STATA software, which has robust econometric tools for the analysis of large panel data sets. This methodological approach not only allows empirical firmness but also allows rational comparison across sub-periods. The method therefore fills a significant vacuum in the literature by bringing sector-level specificity and time-sensitive macroeconomic analysis together.

4. Empirical Results and Discussion

This section presents the empirical findings of the study, which identify determinants of stock volatility in Bangladesh's pharmaceutical and chemical sector before and after COVID-19. The study is separated into pre-pandemic and post-pandemic phases in order to reflect potential structural changes in drivers of volatility. Descriptive statistics, correlation analysis, variance inflation factors (VIF), Breusch-Pagan/ Cook-Weisberg test for heteroskedasticity, Wooldridge test for autocorrelation, Hausman specification test, and regression results are held to provide an insight into evolving stock market behavior.

Table 4.1: Descriptive Statistics of SPV, Macroeconomic and Firm-Specific Variables

Pre-COVID-19				Post-COVID-19			
	Mean	Median	SD		Mean	Median	SD
SPV	.332	.325	0.137	SPV	.352	.35	0.265
ROE	.094	.084	0.167	ROE	.107	.085	0.152
DH	.366	.346	0.166	DH	.384	.347	0.172
DER	1.028	.565	1.404	DER	1.565	.655	2.888
INF	.056	.056	0.001	INF	.087	.088	0.023
GDP	.072	.072	0.005	GDP	.06	.064	0.012

Note: SPV is Stock Price Volatility, ROE is Return on Equity, DH is Directors' Holding, D/E is Debt to Equity Ratio, GDP is Gross Domestic Product growth rate, INF is Inflation Rate.

Table 4.1 depicts that the mean Stock Price Volatility (SPV) increased from 0.332 during the pre-COVID period to 0.352 during the post-COVID period, with the enhancement of standard deviation from 0.137 to 0.265. It indicates increased volatility in the stocks and higher order uncertainty in the pharmaceuticals and chemicals sector in the post-pandemic period. Mean Return on Equity (ROE) rose from 0.094 in pre-COVID to 0.107 in post-COVID, while the standard deviation slightly declined from 0.167 to 0.152. It reflects greater profitability in the post-pandemic period, which may be due to greater demand for health care and chemicals. Directors' Holding (DH) also rose marginally from 0.366 to 0.384, which means directors may have been more optimistic regarding the future performance of the companies after COVID. Standard deviation of DH also rose marginally from 0.166 to 0.172, which means more volatility in directors' shareholding. The Debt-to-Equity Ratio (DER) increased significantly from 1.028 to 1.565, indicating greater use of debt finance in the post-COVID era. The standard deviation also increased significantly from 1.404 to 2.888, indicating greater volatility in the debt composition of firms. Inflation also increased from 0.056 to 0.087, and the standard deviation increased from 0.001 to 0.023. This shows higher inflation pressure post-pandemic, which affects cost structures and overall market volatility. Finally, the mean GDP growth rate decreased from 0.072 in the pre-COVID period to 0.060 in the post-COVID period, illustrating a decrease in economic growth. The standard deviation of GDP growth increased from 0.005 to 0.012, illustrating higher economic volatility in the post-pandemic period.

Table 4.2: Pairwise Correlations of SPV, Macroeconomic and Firm-Specific Variables

Pre-COVID-19						
Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) SPV	1.000					
(2) ROE	-0.465	1.000				
(3) DH	-0.033	0.045	1.000			
(4) DER	0.163	-0.042	0.564	1.000		
(5) INF	-0.184	-0.111	0.003	0.019	1.000	
(6) GDP	0.285	-0.154	-0.007	-0.036	-0.372	1.000
Post-COVID-19						
Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) SPV	1.000					
(2) ROE	-0.139	1.000				
(3) DH	-0.122	0.086	1.000			
(4) DER	0.017	0.120	0.317	1.000		
(5) INF	0.010	0.138	0.020	0.138	1.000	
(6) GDP	-0.101	-0.102	-0.013	-0.128	-0.897	1.000

Pairwise correlation test in Table 4.2 discovers the significant differences in the correlation between stock price volatility (SPV) and key macroeconomic and firm-specific drivers of Bangladesh's pharmaceuticals and chemicals sector in pre- and post-pandemic periods. Before the pandemic, there was a high negative correlation (-0.465) between SPV and ROE, which means that more profitable companies are less volatile, though it declined after the pandemic (-0.139), which means altered investor response to

profitability. Abdullah et al. (2016) have pointed out a negative correlation between ROE and average share price which is also compatible with this result. Director Holdings (DH) had a negative correlation before COVID (-0.033) but improved somewhat after the pandemic (-0.122), which means slightly less volatility from companies that are more insider-held following COVID-19. Conversely, the Debt-Equity Ratio (DER) was positively correlated (0.163) with SPV prior to COVID, meaning companies that are more leveraged are more volatile, but the correlation declined (0.017) following the pandemic, meaning leverage is progressively less of a driver. The impact of inflation on volatility shifted from being in negative (-0.184) to near zero (0.010) post-COVID. The findings of inflation are consistent with the findings of Al-Abbadi & Abdul-Khaliq (2017) and Al Qaisi et al. (2016), meaning stock prices are less sensitive to inflation. GDP growth, which was previously positively related (0.285) to SPV, turned negative (-0.101) post-pandemic, demonstrating that economic recovery efforts cause market stabilization. On the whole, the post-pandemic period shows a change in drivers of volatility of the stock market, with less influence of firm-specific drivers like profitability and leverage, while macroeconomic drivers, particularly GDP, exerted a stabilizing effect.

Table 4.3: Variance Inflation Factor Test for Multicollinearity

Pre-COVID-19			Post-COVID-19		
	VIF	1/VIF		VIF	1/VIF
DER	1.482	.675	DER	1.141	.876
DH	1.48	.676	DH	1.116	.896
GDP	1.219	.821	GDP	5.153	.194
INF	1.201	.832	INF	5.206	.192
ROE	1.071	.934	ROE	1.036	.965
Mean VIF	1.29		Mean VIF	2.73	

Note: The Variance Inflation Factor (VIF) test is conducted to test multicollinearity between independent variables. Over a VIF of 10 is usually a sign of serious multicollinearity, 5-10 a reason for concern, and less than 5 is usually okay.

Table 4.3 indicates that in the pre-COVID phase, variables have low VIF scores, with a maximum of 1.482 (DER), which indicates inconsiderable multicollinearity. The mean VIF is 1.29, which also indicates that there is no threat of multicollinearity. For post-COVID, inflation (INF) and GDP possess very high VIF scores of 5.206 and 5.153, respectively, which indicate a threat of moderate multicollinearity. As noted by Bayman and Dexter (2021), a VIF of more than 10 usually indicates a remedy for the problem of multicollinearity. Therefore, as none of the values is greater than 10, the issue is not critical. The mean VIF increases to 2.73, indicating a higher level of correlation between explanatory variables than before the pandemic.

Table 4.4: Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity

Pre-COVID-19	Post-COVID-19
H_0: Constant variance	H_0: Constant variance
chi2(1) =0.17	chi2(1) =0.20
Prob > chi2 = 0.6803	Prob > chi2 = 0.6554

Table 4.4 presents the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity output for both pre-COVID and post-COVID periods, showing that there is no heteroskedasticity. The null hypothesis of homoskedasticity cannot be rejected since the p-values are significantly higher than 0.05. This is to say that the data is not heteroskedastic in both periods, as the variance of error terms is homogeneous across observations. It is not necessary to use a feasible generalized least squares (FGLS) model because heteroskedasticity is not present.

Table 4.5: Wooldridge Test for First Order Autocorrelation

Pre-COVID-19	Post-COVID-19
H_0: no first-order autocorrelation	H_0: no first-order autocorrelation
F (1, 18) =1.775	F (1, 18) =46.151
Prob > F =0.1993	Prob > F =0.0000

As seen in Table 4.5, the F statistic is 1.775, with a p-value of 0.1993. Since the p-value is greater than 0.05, we fail to reject the null hypothesis, indicating no significant autocorrelation in the pre-COVID period. The F-statistic is 46.151, with a p-value of 0.0000. P-values below 0.05 indicate high first-order autocorrelation in the post-COVID era, thus rejecting the null hypothesis. There is little indication that past stock price volatility influenced future volatility to any quantifiable degree because there was no autocorrelation in the pre-COVID era. But high autocorrelation in the post-COVID era reflects persistent volatility trends after rising uncertainty. Political uncertainty, dollar crisis, and students' movement are probable causes of widespread market volatility and investors' risk aversion.

Table 4.6: Hausman (1978) Specification Test for Model Selection

Pre-COVID-19		Post-COVID-19	
	Coefficient		Coefficient
Chi-square test value	5.439	Chi-square test value	5.393
P-value	.365	P-value	.37

In the Hausman Specification Test, the hypotheses are as follows:

Null Hypothesis(H_0): The random effects (RE) model is appropriate.

Alternative Hypothesis (H_1): The fixed effects (FE) model is appropriate.

Table 4.6 shows that before the COVID phase, the value of the chi-square test = 5.439 and the corresponding p-value = 0.365, whereas the post-COVID period holds the value of the chi-square test = 5.393 and corresponding p-value = 0.37. Since in both cases p-values are greater than the conventional values of significance level (0.01, 0.05, or even 0.10), we cannot reject the null hypothesis that the random effects model would be superior compared to the fixed effects model. This means that the unobserved individual effects in the dataset are uncorrelated with the explanatory variables, and using a random effects model would be more efficient for the analysis of stock volatility in Bangladesh's pharmaceutical and chemical sector. Similar to this, Sutrisno (2020) has determined that the optimal estimation technique for the panel data is the random effect model.

Table 4.7 Regression Analysis Results (Random Effects)

	Pre-COVID-19				Post-COVID-19			
	Coef.	St. Err.	t-value	p-value	Coef.	St. Err.	t-value	p-value
ROE	-.311**	.065	-4.82	0	-.191	.212	-0.90	.367
DH	-.041	.161	-0.25	.802	-.218	.242	-0.90	.367
DER	.004	.018	0.24	.807	.007	.013	0.50	.62
INF	-27.042**	11.194	-2.42	.016	-4.379*	2.642	-1.66	.097
GDP	4.879**	2.017	2.42	.016	-10.337*	5.308	-1.95	.051
Constant	1.527	.7	2.18	.029	1.447***	.54	2.68	.007
	Overall r-squared	0.301	Number of obs	76	Overall r-squared	0.076	Number of obs	76
	Chi-square	46.619	Prob > chi2	0.000	Chi-square	5.782	Prob > chi2	0.328
*** p<.01, ** p<.05, * p<.1								

The random effect regression results of pre-COVID and post-COVID periods unveil the determinants of the stock price volatility (SPV) of Bangladesh's pharmaceutical and chemical sector. The Random Effects Models of Stock Price Volatility (SPV) are:

Pre-COVID-19 Model:

$$SPV_{it} = 1.527 - 0.311ROE_{it} - 0.041DH_{it} + 0.004DER_{it} - 27.042INF_{it} + 4.879GDP_{it} + \varepsilon_{it} \text{..... [2]}$$

Post-COVID-19 Model:

$$SPV_{it} = 1.447 - 0.191ROE_{it} - 0.218DH_{it} + 0.007DER_{it} - 4.379INF_{it} - 10.337GDP_{it} + \varepsilon_{it} \text{..... [3]}$$

Table 4.7 shows that in the pre-COVID period, ROE (-0.311, t value= -4.82, p<0.01): ROE is negative and significant with SPV, suggesting that profitability lessens volatility. Similarly, Khan and Hameed (2023) reveal that ROE significantly reduces stock price volatility. INF (-27.042, t value= -2.42, p<0.05): SPV is significantly influenced by inflation, suggesting that inflation pressure reduces volatility. Megaravalli and Sampagnaro (2018) and Eldomiaty et al. (2020) have also established that stock prices tend to have a negative correlation with inflation rates. GDP (4.879, t value=2.42, p<0.05): SPV is positively influenced by economic growth, implying that the stock prices were more volatile as GDP varied. ROE, INF, and GDP statistically significantly influence SPV in the pre-pandemic period. DH and DER: They are not statistically significant, i.e., ownership by the board and the debt-equity ratio did not significantly influence volatility in the pre-pandemic period. Combined, the model explains 30.1% of the variance in SPV, and the model as a whole has high significance ($p < 0.01$, Chi-square test = 46.619), i.e., it is a good fit.

Table 4.7 also shows that in the post-COVID period, ROE (-0.191, t = -0.90, p = 0.367) and DH (-0.218, t = -0.90, p = 0.367): Neither of them is significant as p-values > 0.10, i.e., profitability and directors' holding have no impact on SPV in the post-pandemic period. INF (-4.379, t value= -1.66, p<0.10): The influence of inflation is weaker in the post-COVID period, which is statistically significant at the 10% level. GDP (-10.337, t value= -1.95, p<0.10): Contrary to pre-COVID, GDP negatively affects SPV, perhaps due to

economic shocks or recovery patterns, and is significant at the 10% level. GDP is identified to have a negative relation and lower significance with stock price by Alam et al (2016). Debt-Equity Ratio (DER) (0.007, t = 0.50, p = 0.62): Continues to be insignificant ($p > 0.10$) in the post-pandemic period. This model has a poorer fit (7.6% R^2) and the chi-square test is not significant (p=0.328), showing a worse fit than the pre-COVID model.

5. Conclusion and Recommendations

This study focuses macroeconomic and company-specific determinants of stock price volatility in pharmaceutical and chemical industries of Bangladesh before and after the COVID-19 pandemic. Our findings show that return on equity (ROE), inflation, and GDP, are key determinants of stock price volatility for both periods, albeit their roles are significantly differed during the post-pandemic period. We fine that before pandemic, GDP positively relates volatility, while it shows a negative relationship during the post pandemic period. Since it represented both the economic uncertainty and slow recovery after the pandemic. furthermore, inflation has been cited as a recurring source of volatility influence, capturing macroeconomic stability to be important in supporting a healthy stock market.

All these findings suggest the need for more adaptive policy interventions to enhance investors' confidence and market stability. Investment promotion, facilitation of sustainable development, and favorable trade policies need to be accompanied by economic stability to manage volatility. To reduce uncertainty and create a safe economic environment, both of which are critical for long-term economic growth, policymakers must make extra efforts to improve monetary policy transparency as well as consistency (Islam, 2025). Since inflation significantly affects the volatility of the stock market, the monetary policy of the central bank needs to target the level at which level of inflation is to be controlled, so that the financial system is remained stable. Transparency, better corporate governance, and efficiency regulatory bodies are crucial for a stable investment environment, which can contribute towards building investor confidence. The pharmaceutical and chemical sector, a priority sector in the nation's economy, would need specific policy interventions such as research and development incentives, tax rebates, and financial incentives to foster growth and competitiveness. In order to facilitate investors to better understanding and reduce risks associated with the stock market, financial literacy programs must be given high priority. As the market behavior is turning more volatile in the post-pandemic era, monetary and exchange rate policies must be formulated to manage foreign exchange fluctuations and ensure that the financial markets are not destabilized significantly. One caveat that can influence stock price volatility is investors sentiment, which we could not capture due to data limitation in the context of the Bangladesh stock market. We leave this avenue for further research.

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