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Impact of Exchange Rate on the CSE All Share Price Index in Bangladesh: A Vector Error Correction Model-Based Study

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Abstract- **This study aims to investigate the intricate relationship between exchange rate fluctuations and the CSE All Share Price Index (CASPI) in the context of Bangladesh. Employing a Vector Error Correction Model (VECM) as the analytical framework, we delve into the dynamic interactions between these two key economic indicators. Our research draws upon a comprehensive dataset spanning an extended period, allowing for a thorough examination of the short-term and long-term dynamics. The study result shows the daily CSE All Share Price Index and daily foreign currency exchange rate to BDT data is non-stationary, but the 1st difference values are stationary for testing the long run and short run relationship. The study observed that there is long run as well as also short run relationship between the daily CSE All Share Price Index with daily foreign currency exchange rate to BDT. Surprisingly, we observe no positive significant effect of the CSE All Share Price Index on foreign currency exchange rates. These findings provide valuable insights into the intricate interplay between macroeconomic variables and financial markets, with practical implications for risk management, investment decisions, and policy formulation, particularly within the context of Bangladesh's rapidly evolving financial landscape.**
Keywords: **Chittagong Stock Exchange (CSE), Cointegration, CSE All Share Price Index (CASPI), Exchange Rate, Stock Market Index, Vector Error Correction Model (VECM)**

I. INTRODUCTION

In today's interconnected global economy, the relationship between financial markets and macroeconomic variables has garnered significant attention from researchers, policymakers, and investors alike. Among these variables, the exchange rate and stock prices hold a crucial position, as their interactions have the potential to influence economic performance, investment decisions, and financial stability. Understanding the intricate linkages between exchange rate movements and stock price dynamics is imperative for both academic research and practical decision-making.

Numerous investigations have explored the correlation between exchange rates and stock market performance. Certain studies have presented findings suggesting that exchange rates have no discernible impact on stock markets. Conversely, other research has indicated a contrary influence of exchange rates on stock markets. Additionally, a subset of studies has proposed a short-term association between these variables, without evidence of a long-term relationship. Hence, it is evident that various studies have arrived at disparate conclusions within different national contexts.

This study seeks to enhance the current understanding of the link between exchange rate fluctuations and stock price behavior by utilizing the Vector Error Correction Model (VECM) within the Bangladeshi context. The VECM framework is selected for its capability to effectively capture both short-term and long-term interactions between variables, making it an ideal tool for examining the intricate and dynamic relationship between exchange rates and prices of stock market.

Over the years, numerous studies have explored the relationship that exists between exchange rates and stock prices from different angles, yielding a range of findings and insights. Some research suggests that changes in exchange rates can impact the competitiveness of firms, their profitability, and ultimately their stock prices. On the other hand, theories such as the portfolio balance theory propose that exchange rate movements can influence investment decisions, leading to changes in stock prices.

The volatility and unpredictability inherent in exchange rates can create a challenging environment for investors and policymakers. As such, a comprehensive understanding of the factors influencing stock prices and the mechanisms through which exchange rates impact the equity market is essential for informed decision-making.

In brief, this study endeavors to shed light on the impact of exchange rate movements and stock price dynamics, employing the VECM as a powerful tool for analysis. Through this research, we hope to contribute to a deeper understanding of the mechanisms underlying the interactions between financial markets and macroeconomic variables, ultimately aiding in more informed decision-making in an increasingly complex global economy.

II. OBJECTIVE OF THE STUDY

The objective of the study is to determine the impact of daily US Dollar exchange rate in Bangladesh Taka to CSE

All Share Price Index (CSAPI) value by ARDL model in the short run and long run (Bound Test) association ship.

A. Hypothesis

Hypothesis 1
Null Hypothesis 1 (H_0): There is no unit root in the daily CSE All Share Price Index (CSAPI) value and daily US Dollar exchange rate.

Alternative Hypothesis 1 (H_1): There is a unit root in the daily CSE All Share Price Index (CSAPI) value and daily US Dollar exchange rate.

Hypothesis 2
Null Hypothesis 2 (H_0): There is no long run relationship between daily CSE All Share Price Index (CSAPI) value with daily US Dollar exchange rate.

Alternative Hypothesis 2 (H_1): There is a long run relationship between daily CSE All Share Price Index (CSAPI) value with daily US Dollar exchange rate.

Hypothesis 3
Null Hypothesis 3 (H_0): There is no short run relationship between daily CSE All Share Price Index (CSAPI) value with daily US Dollar exchange rate.

Alternative Hypothesis 3 (H_1): There is a short run relationship between daily CSE All Share Price Index (CSAPI) value with daily US Dollar exchange rate.

III. LITERATURE REVIEW

Various empirical studies have sought to examine the intricate relationship between exchange rates and stock prices, and these investigations have extended across different nations (Malliaropulos, 1998; Omondi and Olweny, 2011; Mgammal, 2012; Suriani *et al.,* 2015). However, the outcomes of these studies have exhibited notable disparities, which can likely be attributed to two primary influencing factors. First and foremost, the wide-ranging economic, socio-political, and cultural distinctions among the countries under scrutiny have undoubtedly played a pivotal role (Ozturk, 2010). These unique national characteristics introduce an element of heterogeneity into the analyses, making it challenging to establish a uniform pattern of results. Each nation's economic conditions, political stability, and cultural attributes can significantly impact how exchange rate fluctuations reverberate within their respective stock markets. Secondly, the temporal dimension of these studies is of paramount importance (Novita and Nachrowi, 2005; Adam *et al.,* 2015). Each research endeavor was conducted during a distinct time-series data period, reflecting the dynamic nature of financial markets. The financial landscape can evolve rapidly due to various global and domestic events, from economic crises to policy changes. Consequently, the impacts of exchange rate fluctuations on stock prices can vary significantly over time, and this temporal aspect must be considered when interpreting the findings. Furthermore, it's worth noting that the research extends beyond the simple correlation between exchange rates and stock prices. Researchers like Bag *et al.,* (2017) have delved into the broader implications of exchange rate volatility on stock prices, offering a more nuanced perspective on the topic. Additionally, the examination of asymmetric effects on stock prices has been a focus of inquiry, with notable contributions from scholars such as Bahmani-Oskooee and Saha (2016). These explorations underscore the complexity of the relationship between exchange rates and stock prices and the multifaceted nature of the research in this field.

Olugbenga (2012) conducted an investigation into the impact of exchange rate volatility between the Naira and the USD on Nigeria's stock prices, utilizing monthly data spanning from 1985 to 2009. The results of Granger causality tests unveiled both short-term and long-term effects of exchange rate fluctuations. Mlambo *et al.,* (2013) explored the relationship between currency rate volatility and South Africa's stock prices, employing the GARCH model on monthly data spanning from 2000 to 2010. Their econometric analysis revealed a negative correlation between exchange rate volatility and stock prices or stock market capitalization. Analyzing data from January 2010 to December 2015 using the GARCH model, Perera (2016) indicated a positive impact of euro exchange rate volatility on stock returns. He also found that the volatility of the USD exchange rate and the British Pound had no discernible effect on stock price returns. In a separate study, Sichoongwe (2016) explored the effects of exchange rate volatility on share prices in Zambia, analyzing data from 2000 to 2015 with the GARCH model. The results indicated that exchange rate volatility adversely affected stock prices, highlighting the importance of stabilizing exchange rate movements to attract foreign portfolio investments. Applying Panel-GARCH model Najafzadeh *et al.,* (2016) investigated the influence of exchange rate volatility on stock returns in the D8 countries, which encompass Bangladesh, Egypt, Indonesia, Iran, Malaysia, Nigeria, Pakistan, and Turkey. The study revealed that exchange rate volatility had a significant impact on stock returns solely in Pakistan, Indonesia, and Bangladesh. Mrhari and Dadoui (2017) examined the relationship between exchange rate volatility and stock prices in Morocco, utilizing the VECM test on available data. Their findings demonstrated that exchange rate volatility indeed affected stock prices in the Moroccan context.

Karolyi (2001) contends that with the continual growth of globalization and economic integration all types of firms, including both financial and non-financial firms, have increasingly turned to utilize exchange rate movements as a risk management tool. Aggarwal (1981) provides evidence of a positive impact of exchange rate movements on the US stock market, while Solnik (2000) highlights the substantial influence of exchange rate fluctuations on firm values and the disparities in foreign currency-denominated asset values.

Jumah (2013) asserts that exchange rate movements have a cascading effect on corporate expected cash flows, subsequently influencing stock returns. This influence is brought about by changes in the value of foreign currencies concerning the home currency, impacting cost structures, revenue streams, and competitive dynamics for firms, particularly those engaged in international activities.

Bodnar and Gentry's (1993) research, examining stock exchange returns and exchange rate movements in Japan, Canada, and the US, establish a causal relationship that flows from exchange rates to stock prices. Omondi and Olweny (2011) conducted a study on foreign exchange and stock returns, identifying a notable yet significantly low level of volatility in their findings. Ambunya (2012) conducted an investigation into the relationship between exchange rate movements and stock market return volatility at the NSE during the period spanning January 2007 to December 2011. The results uncovered a robust correlation between stock returns and exchange rates.

Khan (2019) investigated the influence of exchange rates on stock returns in the Shenzhen Stock Exchange, focusing on the period from January 2008 to December 2018. The study utilized the ARDL model to analyze both short-term and long-term relationships between the variables. The ARDL analysis results indicated that exchange rates had a significant and negative impact on stock returns in the Shenzhen Stock Exchange. Additionally, the study revealed that both inflation and interest rates negatively affected stock returns in a statistically significant manner. Based on these findings, the study suggests that Central Bank policymakers should implement strategies to stabilize exchange rates.

Saidi *et al.,* (2021) conducted a comprehensive study to examine the symmetric and asymmetric effects of the IDR/USD exchange rate and its volatility on stock prices in Indonesia. The analysis, based on monthly time series data covering the period from January 2006 to July 2019, utilized both ARDL and NARDL models to assess these relationships. The results revealed that, in the short term, the IDR/USD exchange rate had a symmetric impact on stock prices, while volatility did not demonstrate a similar symmetric effect. However, both the exchange rate and its volatility were found to have asymmetric effects on stock prices. In contrast, the long-term analysis indicated that neither the exchange rate nor its volatility exerted any significant symmetric or asymmetric influence on stock prices. These findings provide a nuanced understanding of how exchange rate movements and their volatility interact with the stock market in Indonesia over different time horizons.

Javangwe and Takawira (2022) explored the connection between South Africa's stock market and exchange rates over the span of four decades, ranging from 1980 to 2020. Their analysis involved quarterly data and employed the Autoregressive Distributed Lag (ARDL) model, aligning with the variables' order of integration. The empirical findings illuminated a long-term association between the variables, with an intriguing discovery of a negative relationship between the movements in the stock market and exchange rate.

On the other hand, Rahman and Uddin (2009) explored the complex relationship between stock prices and exchange rates in the context of the emerging market of Bangladesh. Their research analyzed the monthly nominal exchange rates for the US dollar, pound sterling, euro and Japanese yen, in conjunction with the monthly figures of the Dhaka Stock Exchange General Index, covering the period from June 2003 to March 2008. Their empirical analysis revealed that the data series for exchange rates and stock prices exhibited non-stationarity and were integrated of order one. To investigate the potential for a cointegrating relationship, the researchers applied the Johansen procedure. The results, however, did not indicate a cointegrating relationship between stock prices and exchange rates. Lastly, in their examination of causality, the Granger causality test suggested that stock prices Granger caused the exchange rates of the US dollar and Japanese yen, but no such causal relationship was identified between stock prices and the exchange rates of the euro and pound sterling. Moreover, Chowdhury and Islam (2021) determined that the ARIMA model is effective for predicting daily share prices on the Chittagong Stock Exchange (CSE). In a separate study, Islam and Chowdhury (2022) found that the forecasted foreign currency exchange rates in Bangladesh conform to an ARIMA (1,1,0) model, suggesting its applicability for forecasting foreign currency exchange rates in the country.

Research Gap

While the research landscape has been enriched by studies investigating this relationship in various countries and regions, including South Africa, India, Indonesia, and emerging economies, there remains a distinct lack of comprehensive research specifically addressing the nuanced dynamics within the Bangladeshi context. Although some studies have delved into the interactions between exchange rates and stock prices in Bangladesh, they often possess limitations in terms of their dataset or the scope of analysis, leading to inconclusive findings. This research gap in Bangladesh becomes particularly evident when considering the unique economic and financial circumstances of the country, such as its emerging market status, distinct socio-political conditions, and evolving financial sector. Therefore, there is a compelling need for a rigorous and context-specific investigation that employs the VECM to provide insights into the relationship between exchange rate movements and stock indices, ensuring that policymakers, investors, and scholars have access to robust empirical evidence tailored to the Bangladeshi market. Such a study would not only contribute to the broader understanding of this relationship but also offer practical guidance for stakeholders navigating Bangladesh's evolving financial landscape.

IV. METHODOLOGY

A. Data Collection: A comprehensive dataset spanning a specified time period was collected, encompassing daily or weekly observations of the exchange rate in Bangladesh and the CSE All Share Price Index (CASPI). Exchange rate data were obtained from the website of Bangladesh Bank, the central of bank of Bangladesh, while CASPI data were sourced from the Chittagong Stock Exchange (CSE) and other reliable financial databases. The dataset covers a sufficiently long time horizon (from 1st January 2014 to 30th December 2019) to capture both short-term and long-term dynamics and to ensure robust statistical analysis.

B. Vector Error Correction Model (VECM): To examine the relationship between exchange rates and the CASPI, a Vector Error Correction Model (VECM) was employed. The VECM is a well-established econometric framework that is particularly suited for analyzing the dynamic interactions between non-stationary time series data. This model allows for the investigation of both short-term deviations from equilibrium and the long-term equilibrium relationship between the variables.

C. Variable Selection: In constructing the model, the following key variables were defined.

1. *Dependent Variable:* CASPI (CSE All Share Price Index)
2. *Independent Variable:* Exchange Rate (Bangladeshi Taka to US Dollar)

D. Preprocessing and Stationarity Testing: Prior to modeling, data preprocessing was conducted to ensure stationarity, including differencing the time series data and performing Augmented Dickey-Fuller (ADF) tests. Stationarity is a prerequisite for valid VECM analysis.

E. Interpretation and Analysis: The results of the VECM analysis were interpreted to provide insights into the impact of exchange rate movements on the CASPI. This included assessing the direction and magnitude of short-term and long-term effects.

F. Robustness Checks: To ensure the robustness of the findings, sensitivity analyses were conducted by varying model specifications and assessing the stability of results under different time periods.

V. RESULTS AND DISCUSSION

The descriptive statistics of daily CSE All Share Price Index and daily foreign currency exchange rate to BDT with Augmented Dickey-Fuller and Phillips-Perron Test result is shown in Table I.

TABLE I DESCRIPTIVE STATISTICS WITH AUGMENTED DICKEY-FULLER AND PHILLIPS-PERRON TEST

Test Statistic	CASPI	USDEX
Mean	15611.65	80.41
Maximum	19391.09	84.90
Minimum	12209.51	77.40
Std. Dev.	1712.28	2.72
Observations	1453	1453
Correlation	0.577 (0.000)	
Original (Level) Data		
Augmented Dickey-Fuller Test (p value)	1.471 (0.548)	0.475 (0.986)
Phillips-Perron Test (p value)	1.601 (0.482)	0.769 (0.993)

The minimum to maximum values of daily CSE All Share Price Index and daily foreign currency exchange rate to BDT in 1453 observations are 12209.51 to 19391.09 and 77.40 to 84.90 respectively. The mean with standard deviation of daily CSE All Share Price Index and daily foreign currency exchange rate to BDT are 15611.65 ± 1712.28 and 80.41 ± 2.72 respectively. The Pearson correlation coefficient of daily CSE All Share Price Index and daily foreign currency exchange rate to BDT is 0.577 (at the significance level 0.000). So, there is a strong positive correlation between the two variables.

The daily CSE All Share Price Index and USD exchange rate to BDT from 1st January 2014 to 30th December 2019 are shown with line diagram in Fig. 1.

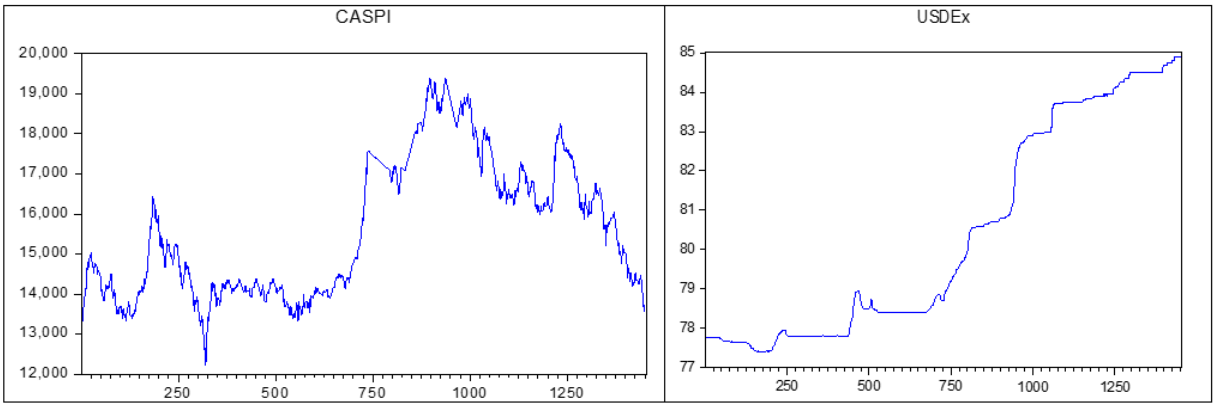

Fig. 1 Daily CSE All Share Price Index and USD exchange rate to BDT

It is observed from the above figure that the daily CSE All Share Price Index and daily foreign currency exchange rate to BDT has a trend value with constant intercept in y-axis. The test statistics for Augmented Dickey-Fuller Test and Phillips-Perron Test for daily CSE All Share Price Index are 1.471 and 1.601 (with p-value 0.548and0.482) respectively. The p-values of Augmented Dickey-Fuller Test and Phillips-Perron Test of daily CSE All Share Price Index are greater than 0.05, which implies that there is not enough evidence to reject the null hypothesis 1 for daily CSE All Share Price Index values. So, the daily CSE All Share Price Index data is non-stationary. Now, the non-stationary daily CSE All Share Price Index values are deducted from the previous values (1st differencing) of daily CSE All Share Price Index to make them stationary to test the long run and short run relationship.

In the same way, the test statistics for Augmented Dickey-Fuller Test and Phillips-Perron Test for daily foreign currency exchange rate to BDT are 0.475 and 0.769 (with p-value 0.986and 0.993) respectively. The p-values of Augmented Dickey-Fuller Test and Phillips-Perron Test of daily foreign currency exchange rate to BDT are greater than 0.05, which implies that there is not enough evidence to reject the null hypothesis 1 for daily foreign currency exchange rate to BDT values. So, the daily foreign currency exchange rate to BDT data is non-stationary. Now, the non-stationary daily foreign currency exchange rate to BDT values are deducted from the previous values (1st differencing) of daily foreign currency exchange rate to BDT to make them stationary to test the long run and short run relationship.

So, the data values are converted into 1st difference form and then the daily CSE All Share Price Index and daily USD exchange rate to BDT are shown in Fig. 2.

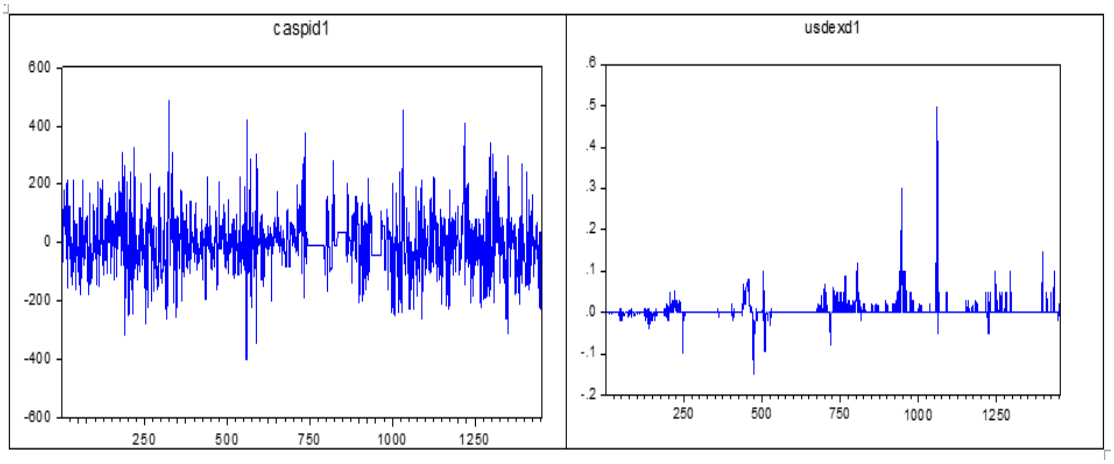

Fig. 2 1st difference of Daily CSE All Share Price Index and USD exchange rate to BDT

Then the Augmented Dickey-Fuller Test has been conducted again for each daily CSE All Share Price Index and daily foreign currency exchange rate to BDT to test whether the data values are stationary and the result is shown in Table II.

TABLE II 1ST DIFFERENCE OF AUGMENTED DICKEY-FULLER AND PHILLIPS-PERRON TEST

Test Statistic	CASPID1	USDExD1
1st Difference		
Augmented Dickey-Fuller Test (p value)	13.655 (0.000)	9.040 (0.000)
Phillips-Perron Test (p value)	32.271 (0.000)	35.955 (0.000)

The test statistics for Augmented Dickey-Fuller Test and Phillips-Perron Test for daily CSE All Share Price Index (1st difference) are 13.655 and 32.271 (with p-value 0.000 and 0.000). The p-values of Augmented Dickey-Fuller Test and Phillips-Perron Test of daily CSE All Share Price Index (1st difference) are less than 0.05, which implies that the null hypothesis 1 is reject for daily CSE All Share Price Index (1st difference) values and it is stationary. Also, the test statistics for Augmented Dickey-Fuller Test and Phillips-Perron Test for daily foreign currency exchange rate to BDT (1st difference) are 9.040 and 35.955 (with p-value 0.000 and 0.000). The p-values of Augmented Dickey-Fuller Test and Phillips-Perron Test of daily foreign currency exchange rate to BDT (1st difference) are less than 0.05, which implies that the null hypothesis 1 is reject for daily foreign currency exchange rate to BDT (1st difference) values and it is stationary. Now, the stationary daily CSE All Share Price Index (1st difference) and daily foreign currency exchange rate to BDT (1st difference) values are tested Johansen Co-integration test for long run relationship and result is shown in Table III.

TABLE III JOHANSEN COINTEGRATION TEST RESULT

Included observations: 1448 after adjustments				
Trend assumption: Linear deterministic trend				
Series: CASPID1 USDEXD1				
Lags interval (in first differences): 1 to 4				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	**Eigen value**	**Statistic**	**Critical Value**	**Prob.****
None *	0.122737	292.7719	15.49471	0.0001
At most 1 *	0.068763	103.1580	3.841466	0.0000
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	**Eigen value**	**Statistic**	**Critical Value**	**Prob.****
None *	0.122737	189.6139	14.26460	0.0001
At most 1 *	0.068763	103.1580	3.841466	0.0000
Max-eigen value test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

The cointegration test statistics (Trace) and (Maximum Eigenvalue) are 292.77 and 189.61 respectively (at the significance level of 0.000). As the p-values are less than 0.05, so there is a cointegration between daily CSE All Share Price Index (1st difference) and daily foreign currency exchange rate to BDT (1st difference) values. As a result, the null hypothesis 2 is rejected and there is long run relationship between the daily CSE All Share Price Index with daily foreign currency exchange rate to BDT. Now we test the Vector Error Correction Model (VECM) to the short run relationship between the daily CSE All Share Price Index with daily foreign currency exchange rate to BDT. To test the VEC Model we will select the lag order selection criteria and result is shown in Table IV.

TABLE IV LAG ORDER SELECTION FOR VECM

VAR Lag Order Selection Criteria					
Endogenous variables: CASPID1 USDEXD1					
Exogenous variables: C					
Included observations: 1445					
Lag	LogL	LR	FPE	AIC	HQ
0	-5445.381	NA	6.448664	7.539627	7.542352
1	-5353.714	182.9531	5.711803	7.418289	7.426465
2	-5307.831	91.44792	5.390109	7.360320	7.373947
3	-5300.371	14.84813	5.364357	7.355530	7.374608
4	-5280.601	39.29266	5.248542	7.333704	7.358233
5	-5266.393	28.20114	5.174905	7.319574	7.349554
6	-5257.817	16.99609*	5.142240*	7.313242*	7.348673*
7	-5257.505	0.618107	5.168557	7.318346	7.359228
8	-5256.366	2.250814	5.189069	7.322306	7.368639
FPE: Final prediction error					
AIC: Akaike information criterion					
HQ: Hannan-Quinn information criterion					

From the above lag order selection table, the Final prediction error, Akaike information criterion and Hannan-Quinn information criterion the selected lag is 6. Now we run the VEC model with lag 6 to test the short run relationship between the daily CSE All Share Price Index with daily foreign currency exchange rate to BDT and result is shown in Table V.

TABLE V VECTOR ERROR CORRECTION ESTIMATES

Vector Error Correction Estimates		
Included observations: 1446 after adjustments		
Standard errors in ( ) & t-statistics in [ ]		
Error Correction	**D(CASPID1)**	**D(USDEXD1)**
CointEq1	-0.693243(0.05412)[-12.8099]	-1.54E-05(1.3E-05)[-1.19184]
D(CASPID1(-1))	-0.116848 (0.05150)[-2.26886]	1.74E-05(1.2E-05)[1.40960]
D(CASPID1(-2))	-0.163316(0.04857)[-3.36228]	1.40E-05(1.2E-05)[1.20661]
D(CASPID1(-3))	-0.087433(0.04514)[-1.93707]	1.48E-05 (1.1E-05)[1.36687]
D(CASPID1(-4))	-0.022902(0.04046)[-0.56601]	1.08E-05(9.7E-06)[1.11645]
D(CASPID1(-5))	0.028128(0.03375)[0.83333]	1.07E-05(8.1E-06)[1.32289]
D(CASPID1(-6))	-0.012050(0.02629)[-0.45834]	6.51E-06 (6.3E-06)[1.03483]
D(USDEXD1(-1))	255.4115 (114.509)[2.23048]	-0.764857(0.02740)[-27.9161]
D(USDEXD1(-2))	349.1271(140.350)[2.48754]	-0.524210(0.03358)[-15.6102]
D(USDEXD1(-3))	477.2956 (146.490)[3.25821]	-0.483834 (0.03505)[-13.8040]
D(USDEXD1(-4))	258.6766 (146.204)[1.76928]	-0.346130 (0.03498)[-9.89450]
D(USDEXD1(-5))	40.37405 (138.918)[0.29063]	-0.195881 (0.03324)[-5.89319]
D(USDEXD1(-6))	42.78329(110.942)[0.38564]	-0.044914 (0.02654)[-1.69199]
C	-0.140820(2.58224)[-0.05453]	7.80E-06 (0.00062)[0.01262]
R-squared	0.420346	0.390435
Adj. R-squared	0.415084	0.384902
Sum sq. resids	13806653	0.790419
S.E. equation	98.19123	0.023494
F-statistic	79.87987	70.55520
Log likelihood	-8677.433	3379.209
Akaike AIC	12.02135	-4.654507
Schwarz SC	12.07243	-4.603420
Mean dependent	-0.103858	0.000000
S.D. dependent	128.3884	0.029956
Determinant resid covariance (dof adj.)		5.320075
Determinant resid covariance		5.217557
Log likelihood		-5297.987
Akaike information criterion		7.369277
Schwarz criterion		7.478749
Number of coefficients		30

The p-values of Vector Error Correction Estimates are less than 0.05. The null hypothesis 3 is rejected and there is a short run relationship between the daily CSE All Share Price Index with daily foreign currency exchange rate to BDT. Now we run the VEC Granger Causality to test the effect between the daily CSE All Share Price Index with daily foreign currency exchange rate to BDT and result is shown in Table VI.

TABLE VI VEC GRANGER CAUSALITY

VEC Granger Causality/Block Exogeneity Wald Tests			
Sample: 1 1453			
Included observations: 1446			
Dependent variable: D(CASPID1)			
Excluded	Chi-sq	df	Prob.
D(USDEXD1)	14.17017	6	0.0278
All	14.17017	6	0.0278
Dependent variable: D(USDEXD1)			
Excluded	Chi-sq	df	Prob.
D(CASPID1)	2.795091	6	0.8341
All	2.795091	6	0.8341

The Granger Causality test result shows that the Chi-Square test statistic of daily foreign currency exchange rate to BDT to daily CSE All Share Price Index is 14.170 (p = 0.028). So there is a positive significant effect of daily foreign currency exchange rate to BDT to daily CSE All Share Price Index.

But the Granger Causality test result shows that the Chi-Square test statistic of BDT to daily CSE All Share Price Index to daily foreign currency exchange rate is 2.795 (p = 0.834). So there is no positive significant effect of daily CSE All Share Price Index to daily foreign currency exchange rate.

VI. CONCLUSION

The study result shows the daily CSE All Share Price Index and daily foreign currency exchange rate to BDT data is non-stationary, but the 1st difference values of daily CSE All Share Price Index and daily foreign currency exchange rate to BDT data are stationary for testing the long run and short run relationship. The study observed that there is long run relationship between the daily CSE All Share Price Index with daily foreign currency exchange rate to BDT. The study also observed that there is a short run relationship between the daily CSE All Share Price Index with daily foreign currency exchange rate to BDT. Finally, it is observed that there is no positive significant effect of daily CSE All Share Price Index to daily foreign currency exchange rate. It contributes to the understanding of the intricate interplay between macroeconomic variables and financial markets, particularly in emerging economies like Bangladesh. These insights not only deepen our comprehension of macroeconomic dynamics but also offer valuable implications for risk management, investment strategies, and policy frameworks, particularly within the vibrant and evolving financial ecosystem of emerging economies like Bangladesh.

REFERENCES

[1] Adam, P., Rianse, U., Cahyono, E., & Rahim, M. (2015). Modeling of the Dynamics Relationship between World Crude Oil Prices and the Stock Market in Indonesia. *International Journal of Energy Economics and Policy, 5*(2), 550-557.

[2] Aggarwal, R. (1981). Exchange rates and stock prices: A study of the US capital markets under floating exchange rates. *Akron Business and Economic Review*, *12*(3), 7-12.

[3] Ambunya, P. L. (2012). The relationship between exchange rate movement and stock market returns volatility at the Nairobi Securities Exchange. *Masters of Business Administration (MBA) project School of Business, University of Nairobi*.

[4] Bag, T., Azad, T., Razzaq, S., Liaqat, I., & Khan, M. A. (2017). The Impact of Exchange Rate Volatility on Stock Index: Evidence from Pakistan Stock Exchange (PSX). *International Journal of Academic Research in Accounting, Finance and Management Sciences, 7*(3), 70-86. https://doi.org/10.6007/IJARAFMS/v7-i3/3150

[5] Bahmani-Oskooee, M., & Saha, S. (2016). Do Exchange Rate Changes have Symmetric or Asymmetric Effects on Stock Prices?. *Global Finance Journal, 30*, 1-16. https://doi.org/10.1016/j.gfj.2016.06.005

[6] Bodnar, G. M., & Gentry, W. M. (1993). Exchange rate exposure and industry characteristics: evidence from Canada, Japan, and the USA. *Journal of international Money and Finance*, *12*(1), 29-45.

[7] Chowdhury, T.U., & Islam, M.S. (2021). ARIMA Time Series Analysis in Forecasting Daily Stock Price of Chittagong Stock Exchange (CSE). *International Journal of Research and Innovation in Social Science, 5*(6). 214-233.

[8] Islam, M. S. and Chowdhury, T. U. (2022). Application of ARIMA Model in Forecasting Exchange Rate: Evidence from Bangladesh. *Asian Journal of Managerial Science, 11*(2), 33-40.

[9] Javangwe, K. Z., & Takawira, O. (2022) Exchange rate movement and stock market performance: An application of the ARDL model, *Cogent Economics & Finance, 10*(1), 2075520, DOI: 10.1080/23322039.2022.2075520

[10] Jumah, I. M. (2013). Effects of Foreign Exchange Rate Fluctuation On Stock Returns Volatility: A Case Study of Nairobi Securities Exchange (NSE) 1996-2012. *Unpublished Doctoral Dissertation: University of Nairobi*.

[11] Karolyi, G. A. (2001). Why Stock Return Volatility Really Matters. *Institutional Investor Journals Series*, *614*, 1-16.

[12] Khan, M. K. (2019). Impact of Exchange Rate on Stock Returns in Shenzhen Stock Exchange: Analysis Through ARDL Approach. *International Journal of Economics and Management, 1*(2), 15-26.

[13] Malliaropulos, D. (1998). International Stock Return Differentials and Real Exchange Rate Changes. *Journal of International Money and Finance*, *17*, 493-511. https://doi.org/10.1016/S0261-5606(98)00013-8

[14] Mgammal, M. H. H. (2012). The Effect of Inflation, Interest Rates and Exchange Rates on Stock Prices Comparative Study Among Two GCC Countries. *International Journal of Finance and Accounting, 1*(6), 179-189.

[15] Mlambo, C., Maredza, A., & Sibanda, S. (2013). Effects of Exchange Rate Volatility on the Stock Market: A Case Study of South Africa. *Mediterranean Journal of Social Sciences, 4*(14), 561-570. https://doi.org/10.5901/mjss.2013.v4n14p561

[16] Mrhari, E. M., & Daoui, D. (2017). Analysis of the Exchange Rate Volatility Influence on the Share Price: Morocco, as Case Study. *Journal of Public Administration, Finance and Law, 12*, 114-127.

[17] Najafzadeh, B., Monjazeb, M., & Mamipour, S. (2015). The Analysis of Real Exchange Rate Volatility and Stock Exchange Return with PANEL-GARCH Approach (Case Study: D8 Countries). *Iranian Economic Review, 20*(4), 525-550.

[18] Novita, M., & Nachrowi, N. D. (2005). Dynamic Analysis of Stock Price Index and Exchange Rate Using Vector Autoregression (VAR) Empirical Study in JSX, 2001-2004. *Economic and Finance in Indonesia, 53*(3), 263-278. https://doi.org/10.7454/efi.v53i3.134

[19] Olugbenga, A. A. (2012). Exchange Rate Volatility and Stock Market Behaviour: The Nigerian Experience. *European Journal of Business and Management, 4*(5), 31-39.

[20] Omondi, K. & Olweny, T., (2011). The effect of macro-economic factors on stock return volatility in the Nairobi stock exchange, Kenya. *Economics and Finance review*, *1*(10), 34-48.

[21] Ozturk, I. (2010). A literature Survey on Energy-Growth Nexus. *Energy Policy, 38*, 340-34.9. https://doi.org/10.1016/j.enpol. 2009.09.024

[22] Perera H. A. P. K. (2016). Effects of Exchange Rate Volatility on Stock Market Return Volatility: Evidence from an Emerging Market. *International Journal of Science and Research, 5*(1), 1750-1755. https://doi.org/10.21275/v5i1.NOV153206

[23] Rahman, M. L. and Uddin, J. (2009). Relationship between Stock Prices and Exchange Rates: Evidence from Bangladesh. *International Journal of Business and Management, 3*(9). 52-57.

[24] Saidi, L. O., Muthalib, A.A. Adam, P., Rumbia, W. A. & Sani, L. O. A. (2021). Exchange Rate, Exchange Rate Volatility and Stock Prices: An Analysis of the Symmetric and Asymmetric Effect Using ARDL and NARDL Models. *Australasian Accounting, Business and Finance Journal, 15(4), 179-190.*

[25] Sichoongwe, K. (2016). Effects of Exchange Rate Volatility on the Stock Market: The Zambian Experience. *Journal of Economics and Sustainable Development, 7*(4), 114-119.

[26] Solnik, B. (1987). Using financial prices to test exchange rate models: A note. *The journal of Finance*, *42*(1), 141-149.

[27] Suriani, S., Kumar, M. D., Jamil, F., & Muneer, S. (2015). Impact of Exchange Rate on Stock Market. *International Journal of Economics and Financial Issues, 5*(Special Issue), 385-388.