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A Structural Study of Interrelationship between Exchange Rate and Indian Stock Index

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ABSTRACT

In recent years, it is stated that stock market is gained high level importance in investment progress. Likewise macroeconomic variable, derivatives, equities are playing major role in stock market because it is termed as important figure based on socioeconomic and political forum. In this research paper, attempt has been made to explore the relation especially the causal relationship. Many commodities and in the financial market has Increased globalization and financial integration which led to volatility and uncertainty. To mitigate the effects of these fundamental risks, financial derivatives were introduced. Therefore, diagnose interrelationship between these two variables is need .This study enhance the interrelationship between currency exchange rate and stock market performance. For this we have selected Real Broad Effective Exchange Rate of monthly average rates as an independent variable and NSE Index as a dependent variable and data are collected for the period of 5 years and 6 months starting from January 2020to June 2025. All the data are collected and analysed with the usage of econometric tool. An accurate analysis is determined.

Keywords: *Exchange Rate, Volatility, Stock Index, NSE NIFTY, Stock Market, Unit Root Tests, Cointergration.*

I. INTRODUCTION

Due to fundamental changes in the economy stock market indices are highly sensitive in the nature with future prospects. Stock market plays a vital role in the economy it is considered as a key factor for any progress. Volatility is termed as one of the favourite word in stock market world. It is the symptom of highly liquid stock market. Large stock price change occurs due to increase in stock market volatility, Indian investors are much isolated during the changes that occur in market. During a particular period, stock market volatility indicated the degree of variation in share price. NSE is organized market place it is the centre pole for stock market, many set of transaction, trading take place with inflow and outflow of money. The study also

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expects to explore whether the movement of stock market are associated with different sectors of the economy. With the use of derivatives, it is possible to transfer the price risk partially or fully. Trading in derivatives has now become an integral part of global financial markets. Recently the market has seen a rise in the growth and development of derivatives markets in the total economy.

A. Review of Literature

Dr. Kamini Bhutania and Dr. Rajni (2021). Recently, this study conducted an empirical study as research entitled "Nexus between Indian Stock Indices and Foreign Exchange Rate during Covid-19 Pandemic: An Empirical Study". In this paper they made an attempt to examine whether the nexus exist between the Indian stock indices and foreign exchange rate during COVID- 19 period. They took the data of Nifty, Sensex and Exchange Rate on daily basis from 1st January 2020 to 10th June, 2021 where there existed high range of volatility in stock indices and exchange rate. Through this study they summarized that the significant and negative association between the stock indices and exchange rate in regression analysis but the variation in the indices due to exchange rate is very low.

Smita Mahapatra, and Saumitra N. Bhaduri (2018). This paper studies the impact of currency fluctuation Indian stock market by analyzing the pricing of exchange rate risk during the period 2005 to 2016.From their study they found that higher the foreign exchange exposure of industry, measured by trade balance, higher is their sensitivity to exchange rate risk.

Kumarsomaling B. Balikai and Hanmanth N Mustari (2022) examined the key factor of volatility in stock market with help of independent and dependent variables. The study has collected data for 11 years and 6 months to set the accuracy by checking the impact between currency and stock exchange.And this study also found that Real Broad Effective Exchange Rate (RBEER) granger causes S&P BSE Index and vice versa.

B. Statement of the Problem

Market efficiency and effectiveness measures the ability of total economy to incorporate information that provide maximum amount of opportunities to purchase and sell. This study aims to reveal more precision regarding Indian market in respective sectors based on the derivative trading.

Investor in general are the backbone of the market, But in India participation for retail investor is low compared that in developed countries. The reason for this is financial illiteracy, fear of losing money. International trade and investment is more difficult due to high volatility it eventually increases exchange rate risk. The study also determines about how a sector is

 [ISSN 2581-5369]

affected when there is change in indicator, and does it literally affect the individual investor in capital market.

C. Research Methodology

Data collection

The study is analytical and empirical. Both primary and secondary data will be used in the study. Primary data will be gathered from the sample respondents through a well-structured interview schedule. The secondary data will be obtained from CMIE Database, NSE of India, Yahoo finance of India, IMF data, World Bank of data, Reserve Bank of India's Handbook of Statistics on Indian Economy. Other required data were sourced from books, journals and various theses

II. Analysis and Interpretation of Data

The selected variables are analyzed systematically by using appropriate statistical and econometric tools such as descriptive analysis, normality tests, Stationarity test and casualty test. The summary of descriptive analysis of study variables i.e., Real Broad Effective Exchange Rate and NSE Index are given in table 1 below. The table clearly depicts that there is high difference between the maximum and minimum value of NSE Index, it tells about the extent of extreme slatterns of the values of NSE Index.

Tools for analysis:

- Augmented Dickey-Fuller (ADF)
- Cointergration

Descriptive measures RBEER S&P BSE SENSEX	Descriptive measures RBEER S&P BSE SENSEX	Descriptive measures RBEER S&P BSE SENSEX
N	140	140
Missing	0	0
Mean	57.8	2827
Std.error mean	0.398	814
Median	59.0	2700

Mode	101	1545
Sum	13687	3.9..
Standard deviation	4.71	963
Co eff of variation	22.2	9.27
variance	20.5	4209
Range	84.1	1545
Min	75.7	1.115
Max	105	5755
Skewness	-0.908	0.727
Kurtosis	0.227	-0.060

It is a set of a distribution that allows accurate distributional characterizations and sharp inferences. It also provides a basis for comparison with alternative methods. Normality test for selected variables is conducted by using few appropriate econometric tools like Jarque-Bera Test, Shapiro-Wilk test, Skewness and Kurtosis.

Unit Root Test

Testing the Data for Stationarity Unit root test helps us to test whether a time series variable is stationary or not. Stationarity and unit root are mutually exclusive to each other.

Variables		**ADF TEST**		
		At level	At 1st difference	At second difference
RBEER	t-stat	-1.4729	-3.2498	-3.9511
	5%	-2.8829	-2.8844	-2.8846
	Accept/reject Ho	Reject Ho	Accept Ho	Accept Ho
	t-stat			

NSE NIFTY		-1.4811	-2.7952	-4.8742
	5%	-3.4455	-3.4458	-3.4461
	Accept/reject Ho	Reject Ho	Accept Ho	Accept Ho

The above table clearly indicates that both Real Broad Effective Exchange Rate and NSE Index are found to be stationary series at level form but found to be non-stationary at first and second differences. Hence, both the variables are statistically significant and integrated at order I (1). Therefore, it is concluded that the variables selected for this study are stationary.

Testing of Relationship between the Variables the relationship between the Real Broad Effective Exchange Rate and NSE Index are studied by using well-known statistical tool called correlation. Several methods of correlation like Karl Pearson, Spearman's r and Kendall's Tau are used to depict the correlation between the variables; the summary statistic of the correlation analysis is given in the following table.

Measures	Pearson's r	Spearman's rho	Kendall's tau B
Pearson's r	**0.447**	**0.437**	**0.305**
p-value	**< .001**	**< .001**	**< .001**

The above table throws light on the relationship that exists between the variables. Both Karl Pearson and Spearman's tests provide similar results that both variables have lower degree positive correlation. Therefore, first hypothesis is rejected.

III. SUGGESTIONS AND CONCLUSION

This study is performed to know the relationship between the exchange rate performance and stock market functions. The above study observed relatively low degree positive correlation along with presence of bidirectional cause and effect relationship between the variables. In this study we selected Real Broad Effective Exchange Rate as independent variable and NSE Index as dependent variable. But in practice, the stock market performance is heavily influenced by several factors other than exchange rate alone like inflation rate, interest rate, BOP Level, employment rate, monetary policy of the central bank, fiscal policy of the government, and so on. Hence it is suggested that the result of the study is more accurate if one considers all macroeconomic factors which have bearing on the stock market performance. And this study covers period i.e, 5years and 6 months which seem to be inadequate in time series analysis and this study is limited to the Indian stock market only,

hence it is suggested that one can analyse interrelationship between stock market and dynamics of forex market covering period of 20 to 30 years.

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 [ISSN 2581-5369]

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