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The effects of rupee dollar exchange rate parity on the Indian Stock Market

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Abstract: Stock Market is a platform where stocks and securities are traded. It is very dynamic and comprehensive market place. Various tools and techniques like fundamental analysis, technical analysis, charts, and indices are used in analyzing and selecting the appropriate security. There are "n" numbers of factor that affect stock prices like interest rate announcements, indices, inflation rates, quarterly EBIT- EPS Analysis, interim reports, mergers and acquisitions, crude oil and gas inventories, corn and wheat harvests, unexpected world changing news, Fed Actions, G7 country decisions, Br-exit, technology breakouts, exchange rates, etc.

This paper examines the effect of exchange rate i.e. rupee dollar parity on the Indian Stock Market. Exchanges like BSE and NSE are considered for the purpose.

Keywords: Stock Market, Exchange Rate, NSE Nifty, S&P BSE Sensex

Rationale of the study:

Various studies in the past and in recent time shows that there various n numbers of macro-economic factors that influence the stock prices. Majority of the studies only were concerned about the stock market while ignoring the other sectors of the economy. A prudent investor must understand that these macro-economic variables have differentiated impact on different sectors of the economy.

The present study is an attempt to investigate and analyze the relationship between exchange rate volatility and NSE Nifty Index in India. Besides GDP, indices like Nifty are also the significant indicators of economic development of the country. This paper examines how changes in exchange rates and Nifty are related to each other over the period 4th Feb, 2017 to 4th Feb, 2019.

Objectives:

Research study aimed at understanding and revealing the relationship between exchange rate and NSE Nifty Index. The objective of the study more precisely can be bulleted as:

i. To investigate the impact of exchange rates on NSE Index as a whole.
ii. To know the intensity of the relationship between exchange rate and Nifty.
iii. In order to achieve the above objective the underlying hypothesis has been drawn

Hypothesis

Ho: There exist a negative relationship between exchange rate and NSE Nifty.
H1: There exist a positive relationship between exchange rate and NSE Nifty.

Literature Review

A significant relationship exists between stock prices and exchange rates. Early studies (Aggarwal, 1981; Soenen and Hennigar, 1988) in the concerned area had considered only the correlation between the two variables i.e. exchanges rates and stock returns. The theory tries to explain that based on the multinational characteristics of the firm how the fluctuations in the exchange rate can affect the foreign operation as well as the overall profitability of the firm which ultimately affects their stock prices. Conversely, a general downward movement of the stock market will motivate the investors to seek for better returns elsewhere. This decreases

the demand for money resulting into downward movement of interest rates causing outflow of funds and depreciating the domestic currency.

While the theoretical explanation was clear, the empirical evidences mixed. It was Maysami – Koh (2000), who examined the impact of interest rates and exchange rates on stock returns. He showed that these two are determinant of the stock prices. Way back in 1992, through Cointegration test, Oskooe and Sohrabian concluded that there only exist bidirectional causality between these two variables and no relationships in the long run. Najang and Seifert (1992), employing the GARCH framework for daily data from the U.S, Canada, the UK, Germany and Japan, showed that absolute differences in stock returns have positive effects on the exchange rate volatility. Ajayi and Mougoue in 1996 picked daily data from 1985 to 1991 for eight advance economic countries; employed error correction model and causality test and eventually discovered that increase in aggregate domestic stock price has negative short run effect and a positive long run effect on domestic currency value. On the other hand, currency depreciation has both negative short run and positive long run effect on the stock market.

Muhammad (2001), in his article has examined whether stock prices and exchange rates are associated to each other or not. The investigation is totally based upon the secondary data which is collected on South Asian countries, including Pakistan, India, Bangladesh and Sri- Lanka, for the period January 1994 to December 2000 on a month to month basis. The methodology used for this study is co-integration, vector error correction modeling technique and typical Granger causality test to observe the long run and short run association between stock prices and exchange rates. Variables used for this study are the key stock price indices of these countries and the exchange rate between currencies of these countries in relation to US dollars. Outcome shows no long run and short run association connecting the stock prices and exchange rates for Pakistan and India.

Most of the studies in the past have considered bivariate i.e. stock prices and exchange rates estimations. However, the theoretical explanations and further studies show the existence of some other variables which may interact with exchange rates and stock prices. Thus, multivariate estimation is necessary**.**

1. Introduction

Stock Market plays a crucial role in the economic development of a country. The stock market can be broadly categorized into two categories:

Primary Market: The market platform that deals with issuance of new financial securities.

Secondary Market: The market for publically trading already existing securities of the primary market.

One of the major functions of stock market is liquidity creation. Liquidity affects the economic activity of the country. The liquid financial market is the reason for inception of various industrial revolutions earlier. Stock market helps in channelizing the saving towards investment in various productive sectors. As stated earlier that stock market is very dynamic and comprehensive so it is obvious that along with domestic factors the international macro- economic factors also affect the stock market.

Foreign Exchange rate is the rate at which one unit of foreign currency can be exchanged against domestic currency. There has been a complete revolution and transformation of the exchange rate regimes in India. The historical background of the exchange rate regimes can be broadly highlighted in 3 phases:

Par Value System (1947 -1971): In this regime the value of Indian Rupee was pegged to grains of gold. As per the guidelines of IMF, the Indian rupee was pegged 4.15 grains of gold. **Pegged Value Regime (1971 - 1992):** In this regime the domestic currency was pegged to one or more foreign currency. The India Rupee was pegged to US dollar and pound sterling under this regime**.. Liberalized Exchange Rate Management System (LERM):** After 1992, this system came into the picture. Under this dual exchange rate policy was introduced. The Indian rupee was partially converted at official exchange rate and partially at market determined exchange rate. The ratio of conversion at official to market determined exchange rate was 2:3.

a) NSE: NSE stands for National Stock Exchange. It is the India's youngest but largest stock exchange. It was established in the year 1992. Gradually, different states of India started their own exchanges like Calcutta Stock Exchange, Madras Stock Exchange and so on. Government realized that there is a strong need to have a centralized nationwide automated electronic system for stock exchange. This is why, NSE was introduced in India.

NSE shows the economic development of the country.Top performing companies from each sector or the companies having greater market share in specific industry are listed in NSE.Nifty is the index of NSE

which shows the average market capitalization of Top 50 companies listed in NSE.The top 50 companies are decided based on their free floating market capitalization.Free floating market capitalization is the product of total no of shares held by the public and face value or market price of each shares.
A fall in the Nifty point shows fall in prices of the majority listed companies on NSE. Since, the companies listed here are the top performing companies of their respective industry. Their performance is directly linked with the economic development of the country. Therefore, indices are the important parameter of economic development of the country.

b) Global factors affecting stock prices

As we know that stock price varies due to various internal factors such as earning reports, acquisitions and mergers, performance of an individual company etc. However, there are various external factors as well that influences the stock prices. Some of them are:

Economics: Numerous macro-economic factors such as interest rate, inflation rate, unemployment, economic growth etc. are the major determinants in the movement of stock prices. There is direct deep rooted relationship between economic growth and increase in the value of stocks. This is because when an economy grows the company operating in the economy also performs well which ultimately enhances the stock prices. Often, declining interest rate is a positive sign for the stock market whereas a rising inflation rate is a negative sign because this means that the interest rate is going to rise immediately or in near future.

Politics: The perception of the investors regarding a particular party ruling the government might act as a cause for stock price movements. Major events like election which might bring to power a hostile government can push the stock market downward however the converse is also possible if a friendly government comes to power.

Natural Calamities: Let's say due to the occurrence of Earthquake, the city considered as the heart of the nation suffers a huge economic loss. In such case, fear of the investor regarding a slow economic growth can possibly push the stock market down and under the set bench marks.

Market Psychology: At the end of the day, it is the sentiments of the investors that drive the market. Sentiments like fear, greed and confusion results in upward and downward movement of the stock prices. Due to the greed factor everybody in the market starts buying the stocks in large volume which creates the situation of BOOM phase. Whereas due to panic and confusion majority of the investors start selling off their securities which results in downward movement of the stock market.

Man-made disasters: Besides, natural calamities even manmade disasters affect the stock prices. For instance, if oil refinery gets damaged then it will have a direct impact on the oil oriented stocks and its prices. Downward trend can be witnessed in the oil oriented stocks because of above quoted event.

LIBOR: LIBOR stands for London Interbank Offered Rate. For instance, if you were to and ask for money to borrow from your banking counterparts then what rate would they charge? For this purpose 16 banks of London are pooled and they quote their respective rates based on their own parameters. Out of 16 quoted rates, the top 4 and the bottom 4 are taken away. The middle 10 rates are averaged to arrive at a single rate. That single rate is known as LIBOR Rate for that day. Since USD (USA Dollar), INR (Indian Rupee), JPY (Japanese Yen), GBP (Pound Sterling), EURO (European Currency) are the major currencies. Hence, a change in LIBOR is likely to affect USD – INR and therefore NSE Nifty as well.

2. Role of Reserve Bank of India in regulating exchange rate

Prior to New Economic Policy 1991, after independence, India used to follow fixed or pegged exchange rate system. During this regime, India's exchange rate was fixed by RBI against Pound Sterling. With the passage of time, there has been a transition from fixed exchange rate regime to dollars and subsequently to basket of currencies.

Post New Economic Policy 1991, Liberalized Exchange Rate Management System (LERMS) in 1993 was the first step towards reforming exchange rate management. Under this there was a dual exchange rate system, one

that was decided by RBI officially and the other through market forces. RBI had the liberty to the extent of 40% in entire foreign exchange transactions. After 1991, the official rate system was abolished and the exchange rate became market dependent i.e. Market Determined Exchange Rate (MDER). The exchange rate under this regime is decided by the free play of market forces i.e. demand and supply completely. In order to mitigate the impact of exports under MDER, the RBI creates an artificial demand by purchasing dollar. Due to this act of RBI, rupee is released into the system which in turn creates inflationary pressure. Now, in order to stabilize the situation reverse repo auction is undertaken by RBI as Market Stabilization Scheme (MSS)

3. Data and Methodology

The data consist of monthly time series observation regarding the macroeconomic variable namely exchange rate and Nifty covering a period from 4th Feb, 2017 to 4th Feb, 2019. This data has been taken from NSE website and investing.com. Only Indian Rupee- US Dollar exchange rates has been taken for analysis. Frequency of data is kept on weekly basis.

Table – 1: Methodology in Nutshell

Particulars	Descriptions
Research Design	Exploratory Research design
Sampling Design	Secondary data acquired from NSE website and investing.com
Sample Selection	The sample selection for this study will include all the top 50 companies listed on NSE i.e. Nifty 50 Index
Sample Size	106
Data Collection	Secondary data has been used for this study: 1. The information of Nifty has been obtained from NSE official website. http://www.nseindia.com/indices/nifty50data.aspx 2. INR-USD exchange rate data is collected from investing.com http://www.investing.com/currencies/usd-inr-historical-data
Time Period	4th Feb, 2017 – 4th Feb, 2019

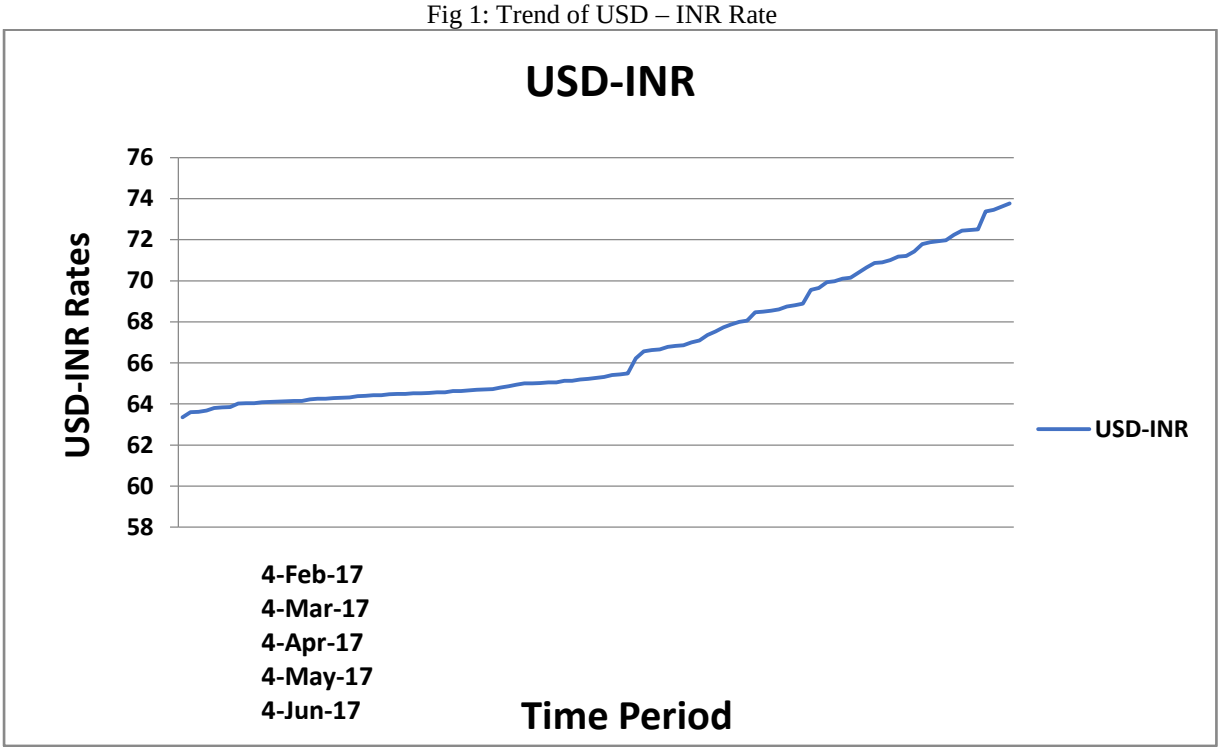
4. Tools and Techniques used:

The collected data were classified as per the categories and counting sheets. The working has been performed on excel sheet and the summary table of the working has been prepared accordingly. Statistical tools such as Mean, standard deviation, correlation analysis, covariance analysis and regression analysis has been used for data analysis.

5. Data Analysis

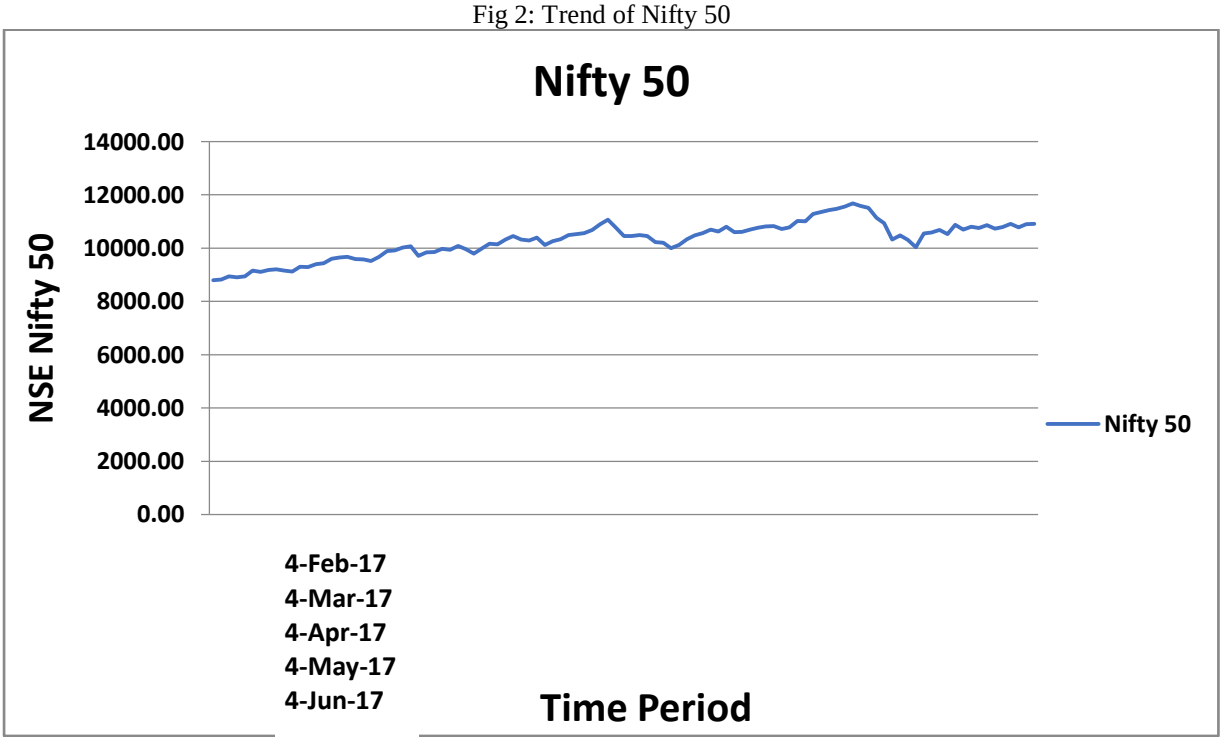
We can study the trend of USD-INR and Nifty 50 with the help of graphs presented in the figure 1 and 2 by using the monthly data.

Fig 1: Trend of USD – INR Rate



Above diagram shows the trend of USD – INR over the period of 4th Feb, 2017 to 4th Feb, 2019. It shows an upward sloping line which reflects continuous depreciation of INR whereas on the other hand continuation appreciation of USD over the last 2 years. As shown in the graph above there has been significant movement in the exchange rate over the last couple of years and hence, this time period has been selected by the researcher to analyze its impact on NSE index i.e. Nifty.

Fig 2: Trend of Nifty 50



Above diagram shows the trend of Nifty 50 over last 2 years covering a period form 4th of Feb, 2017 to 4th Feb, 2019. It shows slightly upward and majorly a sidewise trend of NSE Nifty. The fall in the NSE points in relation to USD – INR exchange rate shows a direct positive relationship between them. Whenever INR depreciates Nifty falls down. Similarly, whenever INR appreciates Nifty pushes up sharply. Because of huge movements and fluctuation in the exchange rate in past couple of years the researcher has taken the data to analyze whether exchange rate has a significant on NSE Nifty or not both in the short run as well as in the long run

Table 2: Descriptive Statistics

Particulars	USD -INR	Nifty 50
Average	66.88	10294.53
Standard Deviation	3.03	678.26
Coefficient of Variation	4.53%	6.59%

Source: Compiled and Computed

From table 2, it can be read that the mean value of USD-INR and Nifty 50 are 66.88 and 10294.53 with standard deviation 3.03 and 678.26 respectively. The coefficient of variation is highest in case of Nifty 50 in comparison to Exchange rate as 6.59% and 4.53% respectively.

Table 3: Correlation Matrix

Pearson Co-relation	USD-INR	Nifty 50
USD-INR	1	
Nifty 50	0.690255928	1

Source: Compiled and Computed

Table 3 shows correlation of the Exchange Rate with Nifty 50. Exchange rates are positively related to the Nifty 50 index. This shows a strong positive correlation between exchange rates and stock prices.

Table 4: Covariance Matrix

Covariance	USD-INR	Nifty 50
USD-INR	9.08	
Nifty 50	1404.06	455660.52

Source: Compiled and Computed

From the above table we can see that the covariance between exchange rate and Nifty 50 is 1404.06 which are showing a positive relationship between these two. It simply reveals the fact that both the variables move in the same direction justifying a close positive association between these two.

To know the concrete relationship among the variables researcher has tried with regression analysis in two different phases introducing the time factor into it. The long term regression analysis summary is given below:

Table 5: Regression Model Summary (Long – Term)

Regression Statistics	
Multiple R	0.690255928
R Square	0.476453246
Adjusted R Square	0.471370267
Standard Error	493.1448182
Observations	105

Source: Compiled and Computed

Here, the data has been taken for the long term analysis which spread over from 4th February 2017 to 4th February 2019. It has been observed from the above table, R^2 is 47.6% showing that exchange rate has only 47.6% impact on NSE Nifty Index. So, we can say that there is no significant relationship between exchange rate and stock prices in the long term. Adjusted R^2 (sometimes written as) is a modification of R that adjusts for the number of explanatory terms in a model. The adjusted R^2 can be negative and will always be less than or equal to R^2. Adjusted R^2 in the table is 47.1% which less than R^2.

Table 6: Regression Model Summary (Short – Term)

Regression Statistics	
Multiple R	0.963168788
R Square	0.927694114
Adjusted R Square	0.926276352
Standard Error	155.701203
Observations	53

Source: Compiled and Computed

As far as the short term is concerned the data has been taken from 4th February 2017 to 4th February 2018 and the result has been shown above. Describing it in the same line as above R^2 92.7%, this shows that exchange rate has 92.7% impact on the Nifty 50 stock prices. So, there is huge impact and a significant relationship between exchange rates and stock prices in the short term. Adjusted R^2 in the table is 92.62% which is less than R^2

6. Hypothesis Testing

H_O: Rejected the null hypothesis

Coming to the hypothesis "there exist a negative relationship between exchange rate and NSE Nifty", based on covariance, correlation and regression model analysis researcher has successfully rejected the null hypothesis.

H_1: Failed to reject the alternate hypothesis

Coming to the hypothesis "there exist a positive relationship between exchange rate and NSE Nifty", the researcher reached at a conclusion that based on the covariance, correlation and regression that both are more or less moving in the same direction. Hence, we have failed to reject the alternate hypothesis.

7. Conclusion

This research empirically examines the causal relationship between Rupee- Dollar and NSE Nifty stock prices. In this study, correlation and regression model is employed to test for the effects of exchange rate on NSE Nifty for the period 4th Feb, 2017 to 4th Feb, 2019 on weekly basis. For the purpose of conducting the

research, NSE Nifty Stock prices are used as dependent variable. While the exchange rate USD-INR rates are used as independent variable.

To begin with, absolute values of data have been taken from internet. Then, the coefficient of correlation between the two variables was computed, which indicated slightly positive correlation between them. Regression statistics was applied on the data, which shows that the exchange rate affects the NSE Nifty in the short- run significantly i.e. 92.7% but this is not the case in the long run as the other major macro-economic variables play significant role in the long run.

8. Recommendations

Based on the above study, it can be clearly observed that in the short run the exchange rate has greater impact on the stock prices. Investors engaged in intra- day or swing trading can make quick bugs if they analyze and study the exchange rates appropriately in short run. However, in the long run along with exchange rate various macro-economic factors such as inflation rate, interest rate, economic growth, etc. also have a significant impact on the stock prices. It is advisable to go for long put positions in the long run for the investors who are engaged in position trading to sneak out a profitable deal.

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