INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X
Impact factor: 4.295
(Volume 5, Issue 6)
Available online at: www.ijariit.com

Impact of fluctuations in exchange rate on Sensex

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ABSTRACT

This paper analyses the "Impact of Fluctuations in Exchange Rate on Sensex." The scope of the study has been restricted to India only. The exchange rates used for the study are of Re/$. The issue of whether stock prices and trade rates are connected or not has gotten significant consideration. On the off chance that stock prices and trade rates are connected and the causation keeps running from trade rates to stock prices, at that point, the emergency in the securities exchanges can be counteracted by controlling the trade rates. In addition, creating nations can endeavor such a connection to pull in/invigorate outside portfolio interest in their very own nations. So also, in the event that the causation keeps running from stock prices to trade rates, at that point experts can concentrate on Local financial arrangements to balance out the securities exchange. On the off chance that the two markets/costs are connected then, financial specialists can utilize this data to anticipate the conduct of one market utilizing the data on other markets.

Keywords— *Financial Markets, Sensex, Exchange rate*

1. INTRODUCTION

This paper analyses the *"Impact of Fluctuations in Exchange Rate on Sensex."* The scope of the study has been restricted to India only. The exchange rates used for the study are of Re/$. The issue of whether stock prices and trade rates are connected or not has gotten significant consideration. On the off chance that stock prices and trade rates are connected and the causation keeps running from trade rates to stock prices, at that point, the emergency in the securities exchanges can be counteracted by controlling the trade rates. In addition, creating nations can endeavor such a connection to pull in/invigorate outside portfolio interest in their very own nations. So also, in the event that the causation keeps running from stock prices to trade rates, at that point experts can concentrate on Local financial arrangements to balance out the securities exchange. On the off chance that the two markets/costs are connected then financial specialists can utilize this data to anticipate the conduct of one market utilizing the data on other markets. The time span of the examination has been taken from 2009-2018. This timespan contains the period where the globe confronted a tremendous economic crisis amid 2008 and different stages where rupee was confronting extreme occasions. This is clear from the way that the most grounded estimation of Rupee against USD remains at Rs 39.320 and the weakest at 66.815. The weekly information of conversion standard has been extricated from the site of Reserve Bank of India and for the weekly information of Sensex, Bombay Stock Exchange's site was trusted upon.

One of the key improvements in the Indian economy is the Indian Stock Market. It is separated into two fundamental market and secondary market classifications. All new money related securities issues are considered by the primary market, yet by the secondary market, securities that have just been issued in the primary market are traded on an open market. The fast development of the securities exchange in both the world and India has driven over the most recent hundred years. Worldwide exchanging of money related securities were likewise directed through the US Vault Receipt (ADR) and Worldwide Safe Receipt (GDR), India. This unpredictability in the trade rates influences the FDI, FII, ADR, GDR streams and in this manner the whole Indian financial exchange. There are 10 years (from 2009 to 2018) to examine the effect of trade rates on the Indian financial exchange (SandP BSE index). The investigation distinguishes the correspondence estimation of SENSEX with the conversion scale as 0.621930928, determining the exchange rate reliance of SENSEX.

2. LITERATURE REVIEW

Purbaya, Sadewa (2000) in his examination "The effect of exchange rate on foreign direct investment" demonstrates that currency depreciation in the host nation makes it a lot simpler for FDIs, particularly when it centers on exports and the overall imports. Expanded FDI prompts a fluctuation in the securities exchange market, subsequently making a connection between the exchange rate and the securities exchange market.

Moore, Pentecost (2006) entitled "The Sources of Real Exchange Rate Fluctuations in India" took a stab at using the VAR way to deal with recognize diverse sources of exchange rate appreciation. Nominal stuns assume an essential job in determining nominal exchange rates, yet nominal stuns are not relevant for the situation of real exchange rates. The examination investigates further that nominal and real exchange rates are not integrated; in other words, they have no long-haul linear relationship.

Gulati and Kakhani (Nov 2012), in their research, "Relationship between Stock Market and Foreign Exchange Market in India: An Empirical Study", analyzed the two-route relationship between the stock market and exchange rate. By using Granger Causality Test, it was discovered that neither SENSEX nor NIFTY has a two-path relationship with foreign exchange (Rs/$).

Doong, Yang, Wang (2005), analyzed the dynamic linkage between stock prices and exchange rates for six Asian rising financial markets and found no closely integrated relationship existed between these two factors.

Abdalla and Murinde (1997), examined the interaction of exchange rates and stock prices in four countries namely India, Pakistan, Korea and the Philippines. They achieved a conclusion that exchange rates cause stock prices to change in India, Pakistan, and Korea. In any case, for the Philippines, they were not ready to find any connection between the stock prices and exchange rates.

Rahman Vol. 3, No. 9, demonstrates that there is no cointegrating relationship between stock prices and exchange rates. It infers that there is no long haul co-movement between the factors and none of the factors can be predicted based on past estimations of other variables. The information utilized were observed to be non-stationary, suggesting that odds of profitable speculation in the stock market or foreign exchange market are negligible and irrelevant.

Nath and Samanta (2003), have utilized the Granger causality test on everyday information from March 1993 to December 2002 to inspect the dynamic connections between India's foreign trades and securities exchange markets. The empirical results of the examination propose that there were no causative connections between these two markets. If the investigation was additionally extended to check that liberalization was combined in the two markets, no substantive causal relationship was found among cash and bill movements aside from the years 1993, 2001 and 2002, when a unidirectional causative effect from the stock index returns an extremely low causal impact, on the contrary, was identified.

3. RESEARCH METHODOLOGY

3.1 Significance of the Study

The connection between the exchange rate and the financial exchange market will upgrade the comprehension of the scientists on these business sectors. It would likewise give members a stage for improving their perspectives on the relations among the two markets.

3.2 Scope of the Study

The investigation incorporates one currency pair, for example, INR/USD for the portrayal of the FOREX market while the major Securities Exchange Market of India (SENSEX) is covered. There is accordingly no review of the connections and impacts of different currencies.

3.3 Data Collection Technique

Considering the nature of my study, I choose to go for secondary data. All the data related to the study has been collected from the RBI website and the BSE website. The scope of the research has been limited to the past 10 years covering the 2008 financial crisis as well.

3.4 Research Problem

In the previous two decades, globalization has made deliberate independence and an association between the stock and foreign exchange markets, interconnecting capital markets, dynamic abolishing of capital inflow boundaries, and progressively adaptable exchange rate movements in transitional and developed economies. Individuals have no clue how two markets are associated with one another. Financial specialists can subsequently put resources into their securities exchange market speculations by exploring the connection between stock prices and exchange rates. At the point when the exchange rates change very frequently, the view of the financial specialist may change.

3.5 Objectives of the Study

The major motive to conduct this study is:

- To learn how rapidly one market showcases the other's new data. If the relationship exists between the exchange market and the securities exchange market.
- To inspect how the foreign exchange market and the securities exchange market in India are connected.

3.6 Research Hypothesis

- **Hypothesis:** A supposition or proposed explanation made on the basis of limited evidence as a starting point for further investigation.
- **Null Hypothesis (H0):** There is no notable relation between SENSEX and Exchange rates.
- **Alternative Hypothesis (H1):** There is a notable relation between SENSEX and Exchange rates

3.7 Design of the Study
A quantitative approach, deductive logical thinking, and descriptive design are used in this research study. Secondary data is acquired through online means, books, periodicals, articles, corporate websites, reports and various other resources used in online databases such as ResearchGate, ProQuest, JSTOR, EBSCO, NASSCOM, IBEF, Google Scholar and search engines such as Bing, Yahoo, Google, DuckDuckGo.

3.8 Data Analysis
Information is gathered for the Indian Stock Index (SENSEX) and the INR-USD conversion scale from first Jan 2009 to 31st Dec 2018. Weekly data observations of Sensex and the INR-US dollar conversion scale were assembled from authentic information segment of www.bseindia.com and www.moneycontrol.com

3.9 Limitations
- Unavailability of intra-day data relating to every minute from both the markets.
- The research is limited to only a period of ten years from 2009 - 2018.
- Only a single pair of currency is used for the examination i.e. USD/INR.

4. ANALYSIS
4.1 Correlation
The main result of a correlation is called the correlation coefficient (or "r"). Correlation coefficients are a statistical measure that determines the strength of the relationship between the relative movements of two variables. The range of the correlation coefficient is limited by 1.0 with absolute values or between -1.0 and 1.0, r so close to +1 or -1 since the two variables are more related Correlation measurements are incorrect if the correlation coefficient is greater than 1.0 or less than -1.0.

If r is close to 0, that means there is no relationship between the variables. If r is positive, it means a variable increases, the other variable also increases. If it is negative, it means it increases, the other decreases.

Interpretation

Table 1: Correlation analysis

		SENSEX	Price
SENSEX	Pearson Correlation	1	.825**
	Sig. (2-tailed)		.000
	N	501	501
Price	Pearson Correlation	.825**	1
	Sig. (2-tailed)	.000	
	N	501	522

**. Correlation is significant at the 0.01 level (2-tailed).

The value of "r" is 0.825, this indicates that there is a strong relationship between Exchange Rate and Sensex. The value is tending towards 1 and is positive, it implies that changes in one variable are strongly correlated with changes in the second variable. When one variable moves in a particular direction, the other also changes significantly in the same direction.

But, even a high degree of correlation does not necessarily mean that a relationship of cause and effect exists between the variables. In other words, correlation does not necessarily imply cause and effect relationship between two variables.

4.2 Regression
Regression takes a number of random variables, which are intended to predict Y, and attempts to find a mathematical relationship. Typically this relation is a straight line (linear regression), which is best suited to all of the data points. The different variables are distinguished in multiple regression by the use of subscription numbers.

Interpretation

Table 2: Regression analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.825[a]	.681	.680	3590.6982528
a. Predictors: (Constant), INR				

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-11853.742	1102.543		-10.751	.000
	INR	611.207	18.745	.825	32.607	.000
a. Dependent Variable: SENSEX						

From the table, the coefficient of determination that is the R square value can be drawn. The R Square value is 0.681 which indicates that 68.1 % of variation in Sensex is explained by the exchange rate.

The p value (0.00) is less than 0.05 indicating that Null Hypothesis is rejected. Consequently, the Alternate Hypothesis is accepted. Thus, Exchange Rate does have a significant impact on the Sensex at 95% Confidence Level.

4.3 ANOVA

ANOVA testing allows more than two comparative groups to see whether there is a relationship between the two groups. Statistics F (also known as the ratio F), the result of the ANOVA formula, allows an analysis of multiple data groups to determine the difference between the samples and in the samples.

If the tested groups are not really different, namely the null hypothesis, ANOVA statistics will show that the F ratio is close to 1. Fisher F's distribution may follow fluctuations in sampling. In fact, this is a group of distribution functions called degrees of freedom of the numerator and degrees of freedom of the denominator with two distinct numbers.

Interpretation

One Way

Table 3: ANOVA analysis

ANOVA					
SENSEX					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	20004124494.718	478	41849632.834	6.682	.000
Within Groups	137778813.137	22	6262673.324		
Total	20141903307.855	500			

This is the table that shows the output of the ANOVA analysis and whether there is a statistically significant difference between our group means. We can see that the significance value is 0.000 (i.e., $p = .000$), which is below 0.05 and, therefore, indicating that the Null Hypothesis is rejected. Consequently, the Alternate Hypothesis is accepted. Thus, Exchange Rate does have a significant impact on the Sensex at a 95% Confidence Level.

4.4 Granger Causality Test

The cause-and-effect idea is closely linked, though it is not exactly the same. The cause of variable X is variable Y if X is the cause of Y or X. However, you are not testing the true cause-and-effect relationship of Granger causality; what you want to know is if there is a variable in the time series before another. In this test, it is assumed that the assumption of joint causality between the exchange rate and stock price variables holds true. This assumption is derived analytically from theory and is backed empirically by many studies.

Interpretation

Table 5: Granger Causality Test Table

Pairwise Granger Causality Tests
Date: 02/19/19 Time: 20:57
Sample: 1 298
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
INR does not Granger Cause SENSEX	297	9.03127...	0.0028...
SENSEX does not Granger Cause INR		0.00061...	0.9802...

Hypothesis 1: RUPEE does not Granger Cause Sensex
Since p value is less than the alpha value 0.05, we will reject the null hypothesis.
Hypothesis 2: Sensex does not Granger Cause RUPEE
Since p value is greater than alpha value 0.05, we will accept the null hypothesis.

The Granger Causality shows that the Exchange Rate affects the value of Sensex. However, the result shows that the value of Sensex does not affect the Exchange Rate.

5. SUMMARY OF FINDINGS AND CONCLUSION

5.1 Findings

- It can be said that by using only one variable, namely the exchange rate, the impact on stock prices has been felt. Many independent variables such as interest rates, money supply, etc. Can be added, then maybe a very better relationship may have been established.
- In fact, stock prices and exchange rates are affected by a multitude of factors such as fiscal and monetary policies, interest rates, inflation, money supply, political factors, international events, Basic operations, foreign exchange reserves, BOP, exchange control, etc.

- The existence of the relationship may also be due to the Indian market being highly integrated or sensitive to new information. In addition, Indian companies are relatively able to expose a lot of foreign exchange exposure today, just like companies in developed countries.
- High volatility is introduced in the exchange market due to the floating exchange regime fostering speculative activities, and increasing the impact of exchange rates on stock prices.
- It is found that Indian stocks have high psychology and some companies' stocks may change without reason. There are several qualitative factors that affect stock prices such as speculation and investor confidence.

6. CONCLUSION

Investors, financiers and policymakers are increasingly exposed to the impact of exchange rate fluctuations on stock returns. Analyzes the fluctuations of the monthly USD / INR exchange rates for various periods, during the entire period between February 2005 and January 2016 for 15 industry groups (comprising 500 companies listed in the S and P BSE 500 index). In the framework of the two-factor APT, the analysis is performed. Our selection of the sample period also allows us, according to our best knowledge, to examine in the last 10 years the impact of the exchange rates in the stock markets and the general sentiment of the investor in India. This is an important part of the monetary crisis that will imminently affect the communities of investors in the EMEs in the coming years. The more recent the study period, the more likely it is that the change in investor sentiment will be captured. In a country like India, where its current government is pushing for more foreign investment to stimulate industrial and infrastructure growth in the country and is experiencing a transition phase in its economy, attention must be paid to how investors and markets react stock exchanges to that change. Empirical evidence suggests that investors anticipate an investment risk premium due to the exposure to the risk of fluctuations in exchange rates, particularly in the last years of the crisis. This means an insufficient safeguard of the companies from the risks of the exchange rate and shows the market efficiencies in the stock or currency markets in the broader macroeconomic sense. The study showed qualitatively that Indian investors now need to reimburse the exchange rate risk. However, the quantitative aspects, such as the difference between the risk premiums requested by investors for different periods of time, go beyond the scope of this document and remain within the scope of future research.

7. REFERENCES

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