

Exchange Rate and Stock Exchange Indices: An Empirical Study on BSE and NSE Indices

Management Insight
15(2) 28-35

DOI: <https://doi.org/10.21844/mijia.15.2.4>

Suraj Prakash Singh*

Correspondence Email: suraj@smsvaranasi.com

Abstract

Exchange rate is a key financial change that affects the decisions made by foreign investors, exporters, foreigners, banks, businesses, economic organizations, policy makers and visitors to the developed and developed world. Exchange rate fluctuations affect the number of overseas investment portfolios, shipping and export competition, the value of international reserves, the amount of debt repayments, and the cost to tourists depending on the value of their currency. Exchange rate fluctuations have important effects on the business cycle of the economy, trade and cash flows and therefore it is important to understand financial development and changes in trade and industry policy. Therefore, studying the impact of changes in exchange rates on the Indian stock market is needed. The stock market and foreign exchange plays an important role in the development of the country. The Asian crisis (1997-1998) is the main reason for establishing a relationship between the exchange rate and the stock price. At this time, the bond market suffered a decline in exchange rates and therefore resulted in a decline in the stock price. So from this, it is understood that although trade flows have a certain impact on the share of corporate stocks, the main source of revenue comes from foreign exchange. Thus, for macro environment the impact of the exchange rate on stock prices depends on global trade and the level of trade imbalance. High intensity in world trade and capital flows have made exchange rates as one of the key determinants of business profitability and equity prices. The present study analyzes the relationship between stock indices and price movements in India. Exchange rate fluctuations have important effects on the business cycle of the economy, trade and cash flows and therefore it is important to understand the financial developments and changes in trade and industry policy. Therefore, studying the impact of changes in exchange rates on the Indian stock market is needed.

Keywords: *exchange rate, foreign exchange, stock exchanges, investment portfolios, competition*

Introduction

The exchange rate theory describes how the exchange rate is determined. We have several ideas today and perspectives developed over the years, reflecting the changing reality of the

foreign exchange market. When new theories were developed, it was at times critical of the original teaching. Today, nearly after three decades introduction of the exchange rate, a consensus has been reached that none of the ideas are wrong, instead, each view is accurate over a

*Assistant Professor, School of Management Sciences Varanasi

period of time. Specifically, Purchasing Power Parity describes a long-term trend in the exchange rate, over 100 years. In several years the flow path in exchange rate fluctuations has a particular demand, and in the short term, the stock exchange method for determining the exchange rate describes the daily determination of exchange rates. We will go through all of these ideas above.

Early back when money were exchanged mainly for trading, it was easy to explain exchange rate based on their use of buying goods. The text of the Purchasing Power Parity theory or PPP, which was developed by Swedish economist Gustav Cassel (1866-1945) in 1921. In only one simple model produced domestically and internationally, PPP is presented as the recently introduced "Relative PPP". The latter focuses on the exchange rate rather than the rate of exchange fluctuations. We choose a time when the exchange rate was at a level that best reflected the international competitiveness of the two countries involved, and used it as a reference. Between this observation period and today, commodity prices will be different for both countries. The exchange rate today is at the same level of PPP if it has changed in a way that has almost eliminated this power differential.

To know the flow of Economy through Balance of Payment accounts economists started to use exchange rate as a tool to bring balance and equilibrium in economy. This continued until the mid- 1970s. Capital control was in place, demand and delivery of foreign exchange were commercially related, and large exchange rates were adjusted under the Bretton Woods plan. In such a world, current account imbalances have been major problems that hampered domestic economic stability. The participants of the Bretton Woods program were forced to maintain fixed exchange rates and existing fixed accounts. This obligation came first with regard to domestic

policy issues. To see this, economists such as Milton Freedman began advocating exchange rate liberalization, using the exchange rate as a tool to bring about change in current account balances. Exports provide foreign exchange metal and imports require the need for foreign exchange, therefore exports were made equal to imports so as to equate the demand in both current account and capital account. It was natural to see demand and supply as a flow variable, because exports and imports were variable flows and this was called the flow method in exchange rates. The flow method was initially expressed with a partial equilibrium model of the current account as a function of Real exchange rate.

Review of Literature

There have been many studies that focused on the range of variables that influences the market index and its importance to include in the model. Some researchers turn to variable classification depending on the references taken when studied.

Chikili and Nguyen (2015) analyze the movement of stock exchanges and stock market returns in the changing world of the BRICS regime. The stock price and exchange rate of all BRICS regions were evaluated using the Markov auto Regression model and VAR. Stock market returns are much higher than exchange returns in all BRICS countries. In the BRICS countries, South Africa is much smaller and Russia is on a much larger scale. Exchange rate changes do not affect the stock market returns of BRICS countries. In contrast, the impact from the stock market returns on exchange rates is significant for all BRICS countries.

Aslam (2014) conducted a study on the relationship between stock market stability and exchange rate in Pakistan. The variables used for this study were the exchange rate (represented by the US \$) and the KSE 100 index. This paper found

a negative correlation between the PKR-USD and the KSE- 100 index. The Granger cause test found that there was a relationship between the KSE 100 and the exchange rate.

Meredza, Courage and Sibanda (2013) examined the effects of fluctuating stock exchange rates on the South African stock market. The author used the GARCH model to find relationships. Weekly relationship between currency fluctuations and stock market performance. The author suggested that, if the South African stock market was not exposed to the negative effects of currency fluctuations, the government could use the exchange rate as a policy to attract FPI.

Gulati and Kakhani (Nov, 2012) examine whether or not an existing relationship exists between foreign exchange rates and the stock market. By using the Granger Causality test and valuation tests, the relationship between the INR / \$ interest rate and the indices in the Indian stock market (SENSEX and NIFTY 50) was determined in detail between 2004 and 2012.

Jun Tu et al. (2011) study the impact of the US economic fluctuation on forecasting the Chinese stock market two conclusions reached depending on the study period considered. The paper concluded that the economic disparity in the United States had no bearing on predicting the Chinese stock market before the 2001 season. However, the results showed that they provided important predictions for the 2001 post.

Yu Hsing (2011) examined the relationship between stock market index of Hungary and relevant macro-economic variables. The study concluded that the stock market index of Hungary has a positive relationship with the real GDP, ratio of government debt to GDP, nominal effective exchange rate and German stock market index. Further, the evidence showed that the market index of Hungary was negatively related to real

interest rate, expected inflation rate and government bond yield in Euro region.

Chinzara (2011) investigated the relationship between the macro economic uncertainty and stock market volatility for South Africa. The study concluded that that the stock market volatility is significantly affected by the macro economic uncertainty. The volatilities in foreign exchange rates and short-term interest rates have significant impact while volatilities in oil price and inflation play a minor role in influencing the stock market volatility.

Benaković and Posedel (2010) analyzed the returns on fourteen stocks of the Croatian capital market taking inflation, industrial production, interest rates, market index and oil price as factors. The results indicated that the index was positively related to the stock returns and had the largest statistical significance for all the stocks. Further, interest rates, industrial production and oil price was positively related while the inflation was otherwise.

Tunalı (2010) investigated the relationship between the macro-economic variables and stock returns in Turkish stock market using the Arbitrage Pricing theory framework. The study concluded that there exists a long run relationship between the basic macro-economic indicators of Turkish economy and the stock returns at different levels.

Agrawal (Dec, 2010) analyzes the relationship between Nifty returns and Indian rupee-US Dollar Exchange Rates. In this study, it was found that Nifty returns as well as Exchange Rates were nonnormally distributed. Through unit root test, it was also established that both the time series, Exchange rate and Nifty returns, were stationary at the level form itself. Correlation between Nifty returns and Exchange Rates was found to be negative.

Næs, Skjeltorp and Odegaard (2009) analysed the return patterns of Oslo Stock exchange. The study concluded that the market, size factor and liquidity factor provided reasonable fit for the cross-section of Norwegian stock returns.

Chinzara and Aziakpono (2009) concluded that the stock returns and volatility in South African are linked to major world stock markets with US, China and Australia having greater impacts. Further, the volatility exhibits asymmetry pattern and stability over the period of time. However, they observed that there was a lack of evidence for risk premium hypothesis for the period of study.

Mohammad et al. (2009) conducted the study on the Karachi stock exchange with influencing variables as foreign exchange reserve, foreign exchange rate, industrial production index, whole sale price index, broad money and gross fixed capital formation for the period of 1986 - 2008. It concluded that the foreign exchange rate and foreign exchange reserve significantly affect the stock prices while the others affect insignificantly.

Johansson (2009), the evidence showed that China has been experiencing increased level of integration with the major financial markets in the period overlapping with the period after China became member of World Trade Organisation. The study postulated that the impact of developed markets like US may increase over time on the emerging markets. Hence, the economic variables of the US may be useful in predicting the Chinese stock market.

From above literature, researcher founded that very few literature been available regarding exchange rate and its impact on stock exchange in Indian context, which give rise to question that Does exchange rate has any impact on stock indices in Indian context?

Research Methodology

- Research Objective:
- To study the impact of exchange rate on NSE.
- To study the impact of exchange rate on BSE.
- Research Design

The descriptive research method has been used for the study. The study will investigate the impact of exchange rate on Indian stock exchanges.

Sample

Annual data for 10 years has been taken for the study. The research is totally based on the secondary data, collected from the website of NSE, BSE and RBI. Exchange rate data have been collected from RBI i.e. data base on India Economy. Closing value of NSE and BSE index has been collected from their NSE and BSE website respectively.

Statistical Techniques and Tools

Dependent variable for the study will be BSE and NSE indices, Independent variable for the study will be exchange rate. In the Study, ratio scales has been used as they have an absolute or true zero of measurement. Ratio scale represents the actual amounts of variables. Correlation and Regression Analysis has been used to analysis the data with help of graph. Hence regression model for the study $Y=C+\beta X$

Analysis and Discussion

Objective 1: To study the impact of exchange rate on BSE

Table-1: Correlation

	Exchange rate	BSE
Exchange rate	1	0.7993
BSE	0.7993	1

Interpretation: Table 1 states relationship between exchange rate and indices of Bombay stock exchange, which reveals that there exist a

strong and positive correlation of 79.93 percent between exchange rate and BSE indices.

Table 2: Regression**Regression Statistics**

Multiple	R 0.7993
R Square	0.6389
Adjusted R Square	0.5938
Standard Error	5750.1404
Observations	10

ANOVA

	df	SS	MS	F	Significance F
Regression	1	468143081.9	468143081.9	14.1586	0.0055
Residual	8	264512925.6	33064115.7		
Total	9	732656007.5			

	Coefficients	Standard Error	t Stat	P-value
Intercept	-22072.7841	12036.2503	-1.8338	0.1040
EXCHANGE RATE(X)	808.4174	214.8448	3.7627	0.0055

*Dependent Variable: BSE

BSE is been explained by independent variable exchange rate by 63.89 percent. However, F-statistics found to be 14.15865 and p-value 0.0055, which indicates that the regression model is good and appropriate for the study. Further beta coefficient for independent variable is 808.4174 with significant p-value 0.0055,

Hence model for the study is $Y=C+\beta X$

$BSE = -22072.7841 + 808.4174 \text{ Exchange rate}$

Objective 2: To study the impact of exchange rate on NSE

Table-3: Correlation

	Exchange rate	NSE
Exchange rate	1	0.9003
BSE	0.9003	1

Interpretation: Table 3 states relationship between exchange rate and indices of National stock exchange, which reveals that there exist a

strong and positive correlation of 90.03 percent between exchange rate and NSE indices.

**Table 4: Regression
Regression Statistics**

Multiple R	0.9003
R Square	0.8105
Adjusted R Square	0.7868
Standard Error	810.3885
Observations	10

ANOVA

	df	SS	MS	F	Significance F
Regression	1	22476422.15	22476422	34.22	47 0.0003
Residual	8	5253836.354	656729.5		
Total	9	27730258.5			

	Coefficients	Standard Error	t Stat	P-value
Intercept	-3798.75	1696.3131	-2.2394	0.0554
EXCHANGE RATE (X)	177.1373	30.2788	5.8501	0.0003

*Dependent Variable: NSE

Interpretation: Table 4 states the regression statistics of the study. It reveals that r-square 0.8105 which shows that any variation in dependent variable NSE is been explained by independent variable exchange rate by 81.05 percent. However, F-statistics found to be 34.2247 and p-value 0.0003, which indicates that the regression model is good and appropriate for the study. Further beta coefficient for

independent variable is 177.1373 with significant p-value 0.0003.

Hence model for the study is $Y=C+\beta X$
 $NSE = -3798.75 + 177.1373 \text{ Exchange rate}$

Conclusion

This study was based on exchange rate and its impact on stock indices of India i.e. BSE and NSE,

as they are the exchanges which are highly prominent among 21 stock exchange with respect to trading volumes and transactions. Researcher of this study founded that exchange rate explains around 63.89 percent variation in BSE, and 90.03 percent variation in NSE, Hence exchange rate provides more significant explanation to NSE variations, exchange rate also has significant impact on BSE and NSE, which could be seen in significant p-value of regression model. This could be due to the reason that NSE has highest number of transactions and volumes when compared to BSE. This study found to be in consistent with previous literature provided by Aslam (2014), Jun Tu et al. (2011). Further scope for the study could be taking more number of variables which effect stock indices, as in this study only exchange rate has been used. Inflation, GDP, fiscal deficit, and interest rate could be taken as independent variables by researcher for future studies.

Reference

- Agrawal, G., Srivastav, A. K., & Srivastava, A. (2010). A study of exchange rates movement and stock market volatility. *International Journal of Business and Management*, 5(12), 62.
- Akbar, M., Khan, S. A., & Khan, F. (2012). The relationship of stock prices and macroeconomic variables revisited: Evidence from Karachi stock exchange. *African Journal of Business Management*, 6(4), 1315-1322.
- Aslam, W. (2014). Relationship between stock market volatility and exchange rate: A study of KSE. *Journal of Public Administration, Finance and Law*, (05), 62-72.
- Benaković, D., & Posedel, P. (2010). Do macroeconomic factors matter for stock returns? Evidence from estimating a multifactor model on the Croatian market. *Business systems research journal: international journal of the Society for Advancing Business & Information Technology (BIT)*, 1(1-2), 39-46.
- Chinzara, Z., & Aziakpono, M. J. (2009). Dynamic returns linkages and volatility transmission between South African and world major stock markets. *Studies in economics and econometrics*, 33(3), 69-94.
- Chinzara, Z. (2011). Macroeconomic uncertainty and conditional stock market volatility in South Africa. *South African Journal of Economics*, 79(1), 27-49.
- Chkili, W., & Nguyen, D. K. (2014). Exchange rate movements and stock market returns in a regime-switching environment: Evidence for BRICS countries. *Research in International Business and Finance*, 31, 46-56.
- Gulati, D., & Kakhani, M. (2012). Relationship between stock market and foreign exchange market in India: An empirical study. *Pacific Business Review International*, 5(5), 66-71.
- Hsing, Y. (2011). The stock market and macroeconomic variables in a BRICS country and policy implications. *International Journal of Economics and Financial Issues*, 1(1), 12-18.
- Johansson, A. C. (2010). China's financial market integration with the world. *Journal of Chinese Economic and Business Studies*, 8(3), 293-314.
- Mlambo, C., Maredza, A., & Sibanda, K. (2013). Effects of exchange rate volatility on the stock market: A case study of South Africa. *Mediterranean Journal of Social Sciences*, 4(14), 561.
- Næs, R., Skjeltorp, J. A., & Ødegaard, B. A. (2009). What factors affect the Oslo Stock Exchange?.
- TUNALI, H., & ÖZDEMİR, O. The Effects Of Financialization Process Of The Turkish Economy On The Labor's Share. *İstanbul Üniversitesi İktisat Fakültesi Mecmuası*, 67(1), 57-116.
- Yang, Z., Tu, A. H., & Zeng, Y. (2014). Dynamic linkages between Asian stock prices and exchange rates: new evidence from causality in quantiles. *Applied Economics*, 46(11), 1184-1201.
- Apte, P. G., 2002, *International Financial Management*, 3rd ed, Tata McGraw Hill, New Delhi.
- Bany, H., and C. Storey, 1990, *Management and Control of Currency and Interest Rate Risk*, Probus, New York.
- Bishop, P., and D. Dixon, 1992, *Foreign Exchange Handbook*, McGraw Hill, Singapore.
- Black, D., 1992, *Financial Market Analysis*, McGraw-Hill, Singapore.
- Black, J., and P. Lawrence, 1992, *ABC of Management: A Hand-book of Management Terms and Concepts*, A.I.T.B.S, Delhi.

Brook, C., 2002, *Introductory Econometrics for Finance*, Cambridge University Press, UK.

Carbaugh, R. J., 2001, *International Economics*, 5th ed, Eastern Press, Bangalore.

Dan, R., and K.P.M. Sundharam, 2004, *Indian Economy*, 19th ed, S. Chand and Company, New Delhi.

Fama, E. F., and M. H. Miller, 1972, *Theory of Finance*, Dryden Press.

Franses, P.H., 1998, *Time Series Models for Business and Economic Forecasting*, Cambridge University Press, UK.

Websites

<https://www.rbi.org.in>

<https://www1.nseindia.com>

<https://www.bseindia.com>

<https://www.moneycontrol.com>

<https://in.investing.com> › Markets › Indices

<https://cleartax.in> › stock-market-index

www.cbic.gov.in › Exchange-Rate-Notifications

<https://www.thomascook.in> › foreign exchange