



# A Study on the Interpretation of Interest Rate Movement and BSE Stocks

HARSHIT SHARMA  
harshitsharmadse@gmail.com

## Abstract:

*This study examines empirically the nature of the relationship between the interest rate and BSE stock on Indian stock market prices. The study on relationship between interest rates and BSE stock with the objective to determine the impact of interest rate movements on BSE stock market prices. The scope of the study helped the investors by providing empirical evidence of effect of interest rate changes on BSE stock market prices and also helped in decision-making. The study was analytical in nature and was based on secondary data only. The data was collected from official website Bombay stock exchange and from the websites of world bank.org. The study deals with two variables one is the dependent named Interest rates and other one is bse stock market price which is independent variables. Further for the analysis of these variables linear regression and correlation techniques were used. The study reflected a significant impact of interest rates changes on stock market prices are affected by the stated determinant but the correlation between the variable did not show positive results. The study can be further used by researchers when market analyses would be conducted or studies related to interest rates would be conducted. The investor must keep focus on the factors like interest rates changes, the organization and the market fluctuations in order to maintain a good financial and profitable position.*

---

**Keywords:** BSE stock exchange, BSE stock market prices, Interest rate

---

## 1. Introduction

### 1.1 Profile of BSE

Bombay Stock Exchange (BSE) (Bombay share Bazaar) is a stock exchange located on Dalal Street, Mumbai, Maharashtra, India. It is the 11th largest stock exchange in the world by market capitalization as on 31 December 2014. Established in 1875, BSE Ltd. (formerly known as Bombay Stock Exchange Ltd.) is the India's oldest Stock Exchange, one of Asia's oldest stock exchange and one of India's leading exchange groups. Over the past 137 years, BSE has facilitated the growth of the Indian corporate sector by providing it an efficient capital-raising platform. Popularly known as BSE, the bourse was established as "The Native Share & Stock Brokers' Association" in 175. BSE is a corporatized and demutualised entity, with a broad shareholder-base which includes two leading global exchanges, Deutsche Bourse, Fuse and Singapore Exchange as strategic partners. BSE provides an efficient and transparent market for trading in equity, debt instruments, derivatives, mutual funds. It also has a platform for trading in equities of small-and-medium enterprises (SME). More than 5000 companies are listed on BSE making it world's No. 1 exchange in terms of listed members. The companies listed on BSE Ltd command a total market capitalization of USD Trillion 1.32 as of January 2015. BSE Ltd is world's fifth most active exchange in terms of number of transactions handled through its electronic trading system. It is also one of the world's leading exchanges (3rd largest in December 2014) for Index options trading (Source: World Federation of Exchanges).

## 2. Literature Review

**(Devereux, Lane, & Xu, 2006)** Financial crisis played an important role to improve monetary policy of emerging markets and they investigated interest rate flexibility fir its implementation. The model of study included nominal rigidities, lending constraints on investment and fluctuation of interest rate for

imported goods. They assumed that there may a deley occur in interest rate fluctuation while pricing importing goods. **(Khrawish, Siam, & Jaradat, 2012)** examined market capitalaizatation rate and interest rate for the market of Jordan named Amman Stock Exchange. Both variables are important to affect country's economy. **(Rano & Bayero, 2018)** studied volatility of stock returns and the impact of inflation. The applied Generaized Heteroskedasticity Model to investigate the relationship for the market of Nigeria and Ghana. Test of the normality of data descriptive statistics indicatoed average stock returns were positive but more volatile for the markets of Nigeria and Ghana. It was found from the model's returns that the volatility for Nageria's market were significant but insignificant for the market Ghana. Market volatility was affected by interest rate in both of the countries. A decrease in inflation caused an increase in market volatility but it was insignificant for the market of Ghana. **Aydemir and Demirhan (2009)** found that there is a bi-directional relationship between interest rate and all the stock market indices in Turkey. There are mixed, positive and negative, causality results from some of the stock market indices to the interest rate. However, there is only negative causal relationship from interest rate to all stock market indices. **Bhattacharya and Mukherjee (2001)**. They have performed similar test using unit-root test, cointegration and Granger causality test between the stock market index BSE Sensitive Index and interest rate, reserves and value of trade balance in India. Their study showed no causal linkage between the BSD Sensitive Index, interest rate. **Vardar et. al. (2008)** performed a similar study to examine the impact of interest rate and interest rate on the composite and sector price indices in Istanbul. Their results showed that not all the indices react in the same way toward the changes of interest rate and interest rate. interest rates and interest rate especially financial sector related. They suggested that investors should follow closely the monetary policies and revisit their investment portfolio strategy whenever there are changes in both interest rate and interest rate. **Bernanke and kuttner (2005)** argue that the price of a stock is a function of its monetary value and the perceived risk in holding the stock. A stock is attractive if the monetary value it bears is high. On the other hand, a stock is unattractive if the perceived risk is high. The authors argue that the money supply affects the stock market through its effect on both the monetary value and the perceived risk. Money supply affects the monetary value of stock through its effects on the interest rate. **Flannery and james (2012)** Study influence of change in interest rates on the value of companies has given rise to a prolific research activity during the past few decades. The bulk of this literature has concentrated on the banking industry due to the peculiar nature of the financial intermediation business. In particular the maturity mismatch identified as the main factor responsible for the high interest rate.

### 3. Research Methodology

For the purpose of study, the secondary data collected from the official websites of BSE, NSE and also Exchange Rate data from [www.exchangerate.com](http://www.exchangerate.com).

### 4. Research Problem

In the last two decades, globalization, inter linkages of the capital markets, gradual eradication of capital inflow barriers and the implementation of more flexible exchange rate mechanism in developed as well as transition economies, created a systematic interdependency between and within the stock and foreign exchange markets. The people do not have any idea about such relationship between two markets. Thus, investigating the relationship between stock prices and exchange rates has an important factor for the investors to invest their investment in the stock market. The investor's perception may be changing whenever the exchange rates changes frequently changed.

### 5. Objectives of the study

The major Intention to conduct this study are...

1. To determine the impact of interest rate movements on BSE stock market prices
2. To investigate the relationship between the foreign exchange market and stock market in India. To see that weather there is a significant relationship and linkage between the two markets.

3. To know how fast one market reflects new information from the other. If relation between foreign exchange market and stock market exist, how the investor uses this information to predict the exchange rate movement or the indices movement.

## 6. Methodology and techniques

The study is analytical in nature. The information was collected from secondary sources like from websites of RBI and BSE. SPSS and Ms excel are the software tools which were used by the researcher. Techniques used to measure the impact of interest rates on bse stock market prices are Regression analysis.

The regression equation:  $Y = a + bX$

**X'** is the value of the Dependent variable (Y), what is being predicted or explained.

**'a'** or Alpha, a constant; equals the value of Y when the value of X=0

**'b'** or Beta, the coefficient of X; the slope of the regression line; how much Y changes for each one-unit change in X.

**'Y'** is the value of the independent variable (Y)

Where, Y= stock market prices

X= Interest rate

## 7. Limitations

1. Un Availability of intra-day minute to minute data of both the markets.
2. The research is limited to period of ten years.
3. Only one pair of USD/INR is used.

## 8. Data Presentation

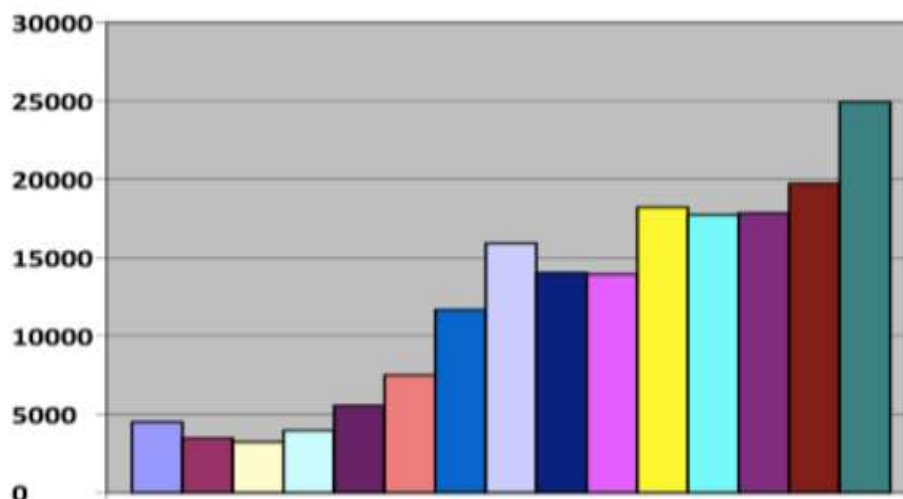
The present study deals with the impact of changes in interest rate on Stock market prices over a period of Fifteen years 2014-16. Only BSE stock market prices have been considered for the purpose of analysis. The average BSE closing price of each year has been computed using simple average of twelve months. The table below presents the average stock market prices for the period 2014-2018.

**Table 1: Movement of BSE Stock Prices**

Years	BSE
2004	4501.847
2005	3475.917
2006	3230.578
2007	3967.638
2008	5551.601
2009	7498.368
2012	11663.58
2013	15901.44
2014	14028.76
2015	13941.48
2016	18207.56
2017	17724.38
2018	17834.85
2017	19727.08
2018	24933.01
Mean	12145.87

*Source: official website of Bombay Stock Exchange*

As shown in the table, the stock market prices over a period of fifteen years. The mean value for the Movement of BSE stock prices is 12145.87.



**Figure 1: Movement of BSE stock prices**

*Source: official website of Bombay Stock Exchange*

The graph above displays the flow of movement of BSE stock prices of the country over a period of Fifteen years ranging from 2014 to 2018. Initially the stock market prices were high and suddenly started declining but after the financial year 2015 it again started increasing towards the positive direction till 2016. There was a small downfall or set back in share market prices in the 2014 and 2015. After 2013-14 it again increased at positive rate moving towards the upward direction till 2018.

## 9. Interest rate

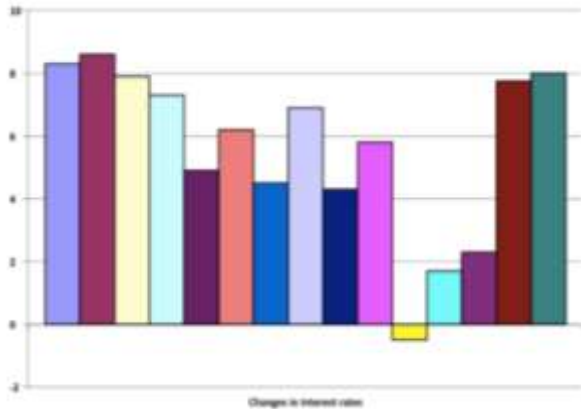
An interest rate is the rate at which interest is paid by a borrower (debtor) for the use of money that they borrow from a lender (creditor). Specifically, the interest rate (I/m) is a percent of principal (P) paid a certain amount of times (m) per period (usually quoted per annum). For example, a small company borrows capital from a bank to buy new assets for its business, and in return the lender receives interest at a predetermined interest rate for deferring the use of funds and instead lending it to the borrower. Interest rates are normally expressed as a percentage of the principal for a period of one year.

**Table 2: Changes in Interest rates**

Years	Interest rate
2002	8.3
2003	8.6
2004	7.9
2005	7.3
2006	4.9
2007	6.2
2008	4.5
2009	6.9
2012	4.3
2013	5.8
2014	-0.5
2015	1.7
2016	2.3
2017	7.75
2018	8
Mean	5.6

*Source: official website of Bombay Stock Exchange*

As shown in the table, the Interest Rates of India over a period of fifteen years. The mean value for the Interest Rates is 5.60.



The graph above displays the statistics of Changes in Interest rates of the country over a period of twelve years ranging from 2014 to 2018. Changes in Interest rates of India showed downward, upward, downward movement in the above-mentioned specific period of time. Interest rates were stable and then fall in 2012, after that it showed a little rise till and then a continuous lows or stable positions were observed. The highest value was in the year 2014 whereas the lowest was in the year 2016.

**Figure 2: Changes in Interest rates**

Source: official website of Bombay Stock Exchange

In the year 2016 the interest rate goes negative because during that period the economy was weak, people and businesses were less and inclined to borrow money. Likely the cost of loans was also affected by supply and demand, and low demand for loans means that the cost of loans the interest rates has come down.

## 10. Data Analysis

Elements of a regression equation: The regression equation is written as  $Y = a + bX$

‘X’ is the value of the Dependent variable (Y), what is being predicted or explained. ‘a’ or Alpha, a constant; equals the value of Y when the value of X=0

‘b’ or Beta, the coefficient of X; the slope of the regression line; how much Y changes for each one-unit change in X.

‘Y’ is the value of the independent variable (Y) Where,

Y= stock market prices,

X= Interest rate

**Table 3: Regression between BSE and Interest rates**

Year	X	Y	xy	x <sup>2</sup>	Y <sup>2</sup>
2002	8.3	4,501.85	37,365.33	68.89	2,02,6 6,626.41
2003	8.6	3,475.92	29,892.89	73.96	1,20,8 1,998.99
2004	7.9	3,230.58	25,521.57	62.41	1,04,3 6,634.21
2005	7.3	3,967.64	28,963.76	53.29	1,57,4 2,151.30
2006	4.9	5,551.60	27,202.84	24.01	3,08,2 0,273.66
2007	6.2	7,498.37	46,489.88	38.44	5,62,2 5,522.66
2008	4.5	11,663.58	52,486.11	20.25	13,60, 39,098.42
2009	6.9	15,901.44	1,09,719.94	47.61	25,28,55,794.07
2012	4.3	14,028.76	60,323.67	18.49	19,68,06,107.14
2013	5.8	13,941.48	80,860.58	33.64	19,43,64,864.59
2014	0.5	18,207.56	9,103.78	0.25	33,15,15,241.15
2015	1.7	17,724.38	30,131.45	2.89	31,41,53,646.38
2016	2.3	17,834.85	41,020.16	5.29	31,80,81,874.52
2017	7.75	19,727.08	1,52,884.87	60.06	38,91,57,685.33
2018	8	24,933.01	1,99,464.08	64	62,16,54,987.66
<b>Mean</b>	<b>83.95</b>	<b>1,82,188.09</b>	<b>9,13,223.34</b>	<b>573.48</b>	<b>2,90,02,02,506.51</b>

The regression equation is written as  $Y = a + bX$   
 $= 17892.78$   
 $= -974.11$

**The regression equation**

$Y = 17892.78 - 978.11b.$

**Karl Pearson's Correlation:**

Y= stock market prices

X= Interest rate

**Table 4: Correlation between BSE and Interest rates**

Year	X	Y	X-X	(X-X)2	Y-Y	(Y-Y)2	(X-X) (Y-Y)
2002	8.3	4,501.85	2.7	7.31	-7,644.03	5,84,31,127.37	-20,664.35
2003	8.6	3,475.92	3	9.02	-8,669.96	7,51,68,130.11	-26,038.77
2005	7.3	3,967.64	1.7	2.9	-8,178.23	6,68,83,521.17	-13,930.26
2006	4.9	5,551.60	-0.7	0.49	-6,594.27	4,34,84,417.93	4,594.01
2007	6.2	7,498.37	0.6	0.36	-4,647.50	2,15,99,299.01	-2,803.99
2008	4.5	11,663.58	-1.1	1.2	-482.29	2,32,606.15	528.91
2009	6.9	15,901.44	1.3	1.7	3,755.57	1,41,04,286.50	4,894.76
2012	4.3	14,028.76	-1.3	1.68	1,882.89	35,45,264.96	-2,441.48
2013	5.8	13,941.48	0.2	0.04	1,795.61	32,24,205.93	365.11
2014	-0.5	18,207.56	-6.1	37.17	6,061.69	3,67,44,054.14	-36,956.09
2015	1.7	17,724.38	-3.9	15.18	5,578.51	3,11,19,744.81	-21,737.58
2016	2.3	17,834.85	-3.3	10.87	5,688.98	3,23,64,463.86	-18,754.66
2017	7.75	19,727.08	2.15	4.64	7,581.21	5,74,74,705.64	16,324.87
2018	8	24,933.01	2.4	5.78	12,787.14	16,35,10,882.89	30,731.75
Mean	<b>83.95</b>	<b>1,82,188.09</b>		<b>103.64</b>		<b>68,73,69,188.28</b>	<b>-1,06,422.67</b>

Correlation Denoted by = r

Co variance = -7094.84

S.D. of X = 2.62

S.D. of Y = 6769.38

r = -0.398

= 0.1589

**11. Findings**

- It can be said that because of using only a single variable, namely exchange rate, the impact on stock prices was not felt. If more of independent variables like interest rates, money supply etc. could be added, then possibly a very good relation could have been established.
- In reality, stock prices and exchange rate are affected by a myriad of factors such as fiscal and monetary policy, interest rates, inflation, money supply, political factors, international events, fundamental performance, forex reserves, BOP, exchange control, etc.
- It is found that Indian stocks are highly sentiment driven and stocks of certain companies may change for no reason. There are few qualitative factors that influence stock prices like speculation and investor confidence level.

**12. Conclusion**

**The following conclusions have been derived from our analysis:** There is no significant cause and effect relationship between the two variables. As the relationship occurred between the variables during different periods is because of chance factor and not because of cause factor. Thus, the results provide

the evidence for the presence goods market or portfolio approach. In the era of increasing integration in financial markets one should take sufficient care while implementing exchange rate policies. Furthermore, indications are that the existence of foreign exchange restrictions does not isolate the domestic capital markets. The general increase in international trade and the resultant increase in economic integration have also increased financial integration and reduced the benefit of international diversification.

## References

- 1.Abdalla, I. S. A. and V. Murinde (1997), "Interest rate and Stock Price Interactions in Emerging Financial Markets: Evidence on India applied Financial Economics 7, 25-35.
- 2.Abhyankar, Abhay H. (1995), Return and Volatility Dynamics in the FT-SE 100 Stock Index and Stock Index Futures Markets, Journal of Futures Markets 15 (4), 457-488.
- 3.Ajayi, R. A. and M. Mougoue (1996), "On the Dynamic Relation between Stock Prices and Interest Rates," Journal of Financial Research 19, 193-207.
- 4.Anand Babu P. et al. (2018), The Temporal Price Relationship between the Index Futures and the Underlying Cash Index: Evidence from the Indian Stock Market, Paper Presented at the International Conference on Business & Finance 2018, India.
- 5.Aydemir, O., & Demirhan, E. (2017). The Relationship between Stock Prices and interest rates. International Research Journal of Finance and Economics, 1 (23), 1450-2887. Relationship between Stock Market and Foreign Exchange Market in India: An Empirical Study by Deepti Gulati and Monika Kakhani, Pacific Business Review International Volume 5
- 6.Bahmani-Oskooee, M. and A. Sohrabian (1992). "Stock Prices and the Effective Interest Rate", Applied Economics, 24, 4, 459-464.
- 7.Chan Kalok (1992), A Further Analysis of the Lead-Lag Relationship between the Cash Market and Stock Index Futures Market, Review of Financial Studies 5 (1), pp. 123-152.
- 8.Harris L. (1989), The October 1987 S&P 500 Stock-Futures Basis, Journal of Finance, Vol. 44, pp.77-99.