



## IMPACT OF INTEREST RATES ON INDIAN STOCK MARKET

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### ABSTRACT

*Stock exchange and interest rate are two key factors of economic growth of a nation. The effects of interest rate on stock exchange provide significant implications for monetary policy, risk management practices, financial securities valuation and government policy concerning financial markets. To investigate the reasons of market inefficiency, relationship between share price and interest rate, and changes of share price and changes of interest rate were determined through regression analysis and linear regression analysis. The goal of this study is to examine the long run and the short run relationships between interest rate and stock market index in India. The performance of the stock market can reveal the overall performance of nation's economy. Similarly, the stock index in a particular sector can reveal the performance of the particular segment, for example, the plantation index. When palm oil-related companies are making huge profits, plantation index will tend to go up. When the stock market is doing good, it may indicate that the economy is experiencing high growth.*

### Introduction

The importance of financial sector within the whole economy, not only in individual countries, but also in the whole world, has increased in recent decades. The development of new

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technologies has made access to financial markets easier and trading more dynamic. One of the most important part of the financial sector is the stock market. A stock market is a place where stocks are traded or we can say bought or sold. It is a very huge market and contains a large amount of stocks holders. Companies get their stock listed to get fund for further growth of the company. Talking about stock holder then some investors do not know about the opportunities they have in stock market they just listen to the broking agency and sometimes incur loss and the one who know about their opportunities in stock market and gets higher return. For which there are many stock exchanges in India. SEBI is the regulating body in India which keep an eye on the working of every company which is listed in the exchange.

The exchange has perpetually been a decent tool for investors to lift their wealth and properties. Presently, there are several major problems within the exchange, specifically the subprime mortgage crisis (Started in year 2006 throughout 2007 till now) wherever housing loans got to folks with unhealthy credit history, and cause the failure of assembling back the loans. once the rate begins to extend, the housing value began to decrease. moreover, this results in the bankruptcy of some major players within the banking sectors, for example: Lehman Brothers, a 158-year-old investment bank, was declared bankruptcy on fifteen Sept 2008.

All this negative news has chain reaction toward the opposite segments like producing, housing and mortgage, commodities. Major indices in US like Dow Jones, S&P 500 and data system are largely bearish and are remittent considerably since then. Earnings prospect are troubled by macro-economic considerations.

Other than the financial ruin, the securities market is suffering from numerous different factors additionally. for instance, the interest rate, gross domestic product, rate of exchange, monetary resource, inflation, economic policy many more on. it's attainable to incorporate all possible economics variables to come to a decision the performance of the securities market since several of those variables are closely related giving rise to valuation issues. For this study, we tend to are keen to seek out the connection between the interest rate and also the securities market index.

Interest rate is another crucial economic variable, affecting the economic development. Interest rate expresses an amount charged to a borrower for using borrowed assets for some period of time. A lender postpones his consumption for some fee, which enables him to consume more in the next period. The interest rate expresses the cost of investment. The development of interest

rates highly affects the growth of economy. So it is important not only to monitor its development, but also to manage it reasonably from policy maker perspective to ensure long-term economic growth.

However, the relationship between interest rate and stock prices is not important only for policy makers. Since the interest rate influences the stock market development, especially the investors should care about its movements and about the monetary policy of central banks that is closely connected with it. Government should also be interested in stock prices because a change in stock returns induces a change in government revenues in the same direction through taxes. Due to high interest rate volatility there had been numerous bank failures, but this also happened due to high interest rate sensitivity of financial institutions. Therefore, regulatory authorities should also be interested in relationship between interest rate and stock market.

## 1.2 Why to know about Interest Rates?

Interest rate in simple words means the cost of borrowing funds. When we borrow funds from a lender, we pay a certain amount to him for using his money for our own purpose. Many a times our spending decisions are also guided by the interest burden that we have to bear. Interest rates are typically noted on an annual basis, known as the annual percentage rate (APR). The assets borrowed could include cash, consumer goods, large assets such as vehicles or buildings. Interest is essentially a rental or leasing charge to the borrower for the asset's use. In the case of a large asset, like a vehicle or building, the interest rate is sometimes known as the "lease rate". When the borrower is considered as a low risk party, they will usually be charged a low interest rate; if the borrower is considered as high risk party, the interest rate that they are charged will be higher.

The differences between the various types of rates, such as nominal and real, are based on several key economic factors. But while these technical variables may seem trivial, lending institutions and retailers have been taking advantage of the public's general ignorance of these distinctions to rake in hundreds of billions of dollars over the years.

But we should be concentrating on real returns on our savings (real return = interest rate – inflation). Even as consumers, interest rate is an integral part of our spending habit as we take

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loans from banks for buying house, cars, and other household items etc. For business' interest rate is also very important as they borrow money from bank for investment purposes like capacity expansion, setting up of plants, modernization etc. So it plays a critical role in business's profitability and on stock prices.

### **Literature Review**

**Henry EgbezienInegbedion** (2012) observed that the exchange rate and interest rate were negatively related to the stock price changes and inflation rate was positively related to the stock price changes in the Nigerian market. The author found a significant combined effect of all the three macroeconomic variables on stock price changes, with which he concluded that the government's macroeconomic policy formulations have significant implications on the stability of the capital market of the country.

**Krishna Reddy** (2010) studied the movements in BSE Sensex in relation to FII investments and identified that FIIs are significant factor determining the liquidity and volatility in the stock

**Uddin and Alam** (2007) examine the linear relationship between share price and interest rate as well as share price and changes of interest rate. In addition, they also explore the association between changes of share price and interest rate and lastly changes of share price and changes of interest rate in Bangladesh. They find for all of the cases that Interest Rate has significant negative relationship with Share Price and Changes of Interest Rate has significant negative relationship with Changes of Share Price.

**Geetha, Mohidin, Chandran and Chong** (2011) investigate the relationship between stock market, expected inflation rate, unexpected inflation rate, exchange rate, interest rate and GDP in the case of Malaysia, US and China. They use co-integration test to determine the number of co-integrating vectors, which shows the long-run relationship between the variables while the short-run relationship was determined using the Vector Error Correction model. Their results indicate that there is a long run co-integration relationship between stock markets and those variables in Malaysia, US and China. On the other hand, there is no short run relationship between the stock market, unexpected inflation, expected inflation, interest rate, exchange rate and GDP for Malaysia and US using VEC. However, China's VEC result shows that there is a short-run relationship between expected inflation rates and China's stock market.

**Mahedi** (2012) examines the long-run relationship and the short-run dynamics among macroeconomic variables and the stock returns of Germany and the United Kingdom. He uses the Johansen Co-integration test to indicate the co-integrating relationship between the stock prices and macroeconomic determinants. And then, he uses error-correction models to investigate both the short-and long-term casual relationships and each case is examined individually. For Germany case, the results show that the short-run causality runs from stock returns to inflation, from money supply to stock returns and from industrial production to stock returns. The long-run causality runs from inflation to stock returns and from exchange rate to stock returns. There is only one short-and long-run relationship, that is from the stock returns to industrial production. For the United Kingdom case, he finds that the short run causality run from stock returns to T-bill, from stock returns to money supply, from stock returns to exchange rate, exchange rate to stock returns and stock returns to industrial production. The long run causality runs from inflation to stock returns. The short and long-run causal relationship runs from stock returns to inflation, from money supply to stock returns and from industrial production to stock returns. These results indicate the existence of short-run interactions and long term causal relationship between both Germany and the UK stock markets and the macroeconomic fundamentals.

**Ray Sarbapriya** (2012) uses a simple linear regression model and Granger causality test to measure the relationship between foreign exchange reserves and stock market capitalization in India. The results show that causality is unidirectional and it runs from foreign exchange reserve to stock market capitalization and that foreign exchange reserves have a positive impact on stock market capitalization in India.

## **Research Methodology**

### **3.1 Methods used in calculation of interest rate and stock prices**

In statistics, regression analysis may be a normally used technique to find relationships among variables and choose whether or not they are negatively or absolutely dependent on one another. linear regression is commonly used by financial professionals and different practitioners to live however one monetary metric impacts the opposite one, like stock value and interest rates. once running a linear regression with stock costs being a dependent variable and interest rates being an informative variable, the user usually obtains coefficients for the intercept term and rate, yet

because the R-squared metric. The correlation between stock costs and interest rates is capable the root of the R-squared price.

### **Linear Regression**

Linear regression is an obligatory tool to find the relationships between numerous metrics in finance. the most important get pleasure from regression analysis comes from its ability to regulate for various factors and find the foremost plausible statistical link between variables and the way they influence one another. simple regression fits a linear line to determined knowledge by minimizing the sq. of error terms derived from the distinction between determined knowledge points and therefore the fitted value from regression.

### **Correlation Coefficient**

The correlation coefficient between stock worth and interest rate shows the purpose to that these 2 variables are linearly connected to every alternative. Correlation is positive, zero or negative and ranges from -1 to one. A negative correlation worth shows that the 2 variables move in opposite directions, whereas positive correlation shows that the 2 variables co-move.

### **Correlation and Regression Results**

Regression for stock value and interest rate produces results show coefficients for intercept term and rate of interest. whereas the regression coefficient for the interest rate is beneficial in estimating however a one percent modification in rate of interest impacts the stock worth, the R-squared metric is that the most helpful live to look at the correlation between the 2 variables. By taking a root of the R-squared coefficient, the user gets the correlation between the stock worth and therefore the rate of interest.

### **3.2 Objective**

This study will help in gaining more knowledge about stock market. The main objective of the study is to check the relationship between the Indian Stock Market and Interest rates. It will also help the investors in trading and will inform them about the behavior of the stock market. The specific objectives are as follows:

- To evaluate relationship between interest rate and stock market

### 3.3 Data Collection

The data used in this study is secondary data. It is mainly collected from BSE and Reserve Bank of India(RBI) and various other sources such as internet, books, newspaper, research papers etc. The impact of interest rate on stock market is studied, by using monthly data from April 2005 to March 2014. The table shows the data for the years 2005-2014.

The dependent variable is Stock returns.

The method used for calculating stock returns is:

Value= Value of total observations/Total no. of observations

The independent variable is the interest rate.

**Table 1:**

<b>Year</b>	<b>Interest rates(jan-dec)</b>	<b>BSE Sensex (jan-dec)</b>
<b>2005</b>	6.04	7498.368
<b>2006</b>	6.73	11663.58
<b>2007</b>	7.00	15901.44
<b>2008</b>	6.93	14028.76
<b>2009</b>	4.59	13941.48
<b>2010</b>	5.18	18207.56
<b>2011</b>	7.55	17724.38
<b>2012</b>	8.12	17834.85
<b>2013</b>	7.52	19727.08
<b>2014</b>	8.00	24941

(Source:<https://rbi.org.in>; <http://www.bseindia.com>)

## Data Analysis and Interpretation

**Table 2: Regression**

Regression Statistics	
Multiple R	0.814
R Square	0.756
Adjusted R Square	0.695
Standard Error	4402.882
Observations	10.000

**Dependent Variable- stock returns**

**Prediction- interest rate**

The value of R square is 0.756 which indicates significant correlation between sensx and interest rate as 75.6% of the sensx fluctuations could be explained by the fluctuations in the interest rate while other 24.4% of the fluctuations depend on some other economic factors which is similar to our observations from literature review.

**Table 3: ANOVA**

	Df	SS	MS	F	Significance F
Regression	1.000	2.975	2.975	2.526	0.023
Residual	8.000	9.424	1.178		
Total	9.000	12.400			

**Dependent Variable- stock returns**

**Prediction- interest rate**

The value of F is 2.526 and Significance F is 0.023 which is less than 0.05 which indicates that Sensx is affected by the changes in interest rates and shows that the results are statistically significant and we should not ignore the data as it has little or no sampling or experimental error.

Table 4: Coefficients

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	2701.865	8573.694	0.315	0.761	-17069.107	22472.838
X Variable 1	1987.139	1250.353	1.589	0.002	-896.179	4870.458

**Dependent Variable- stock returns**

**Prediction- interest rate**

The P-value is 0.002 which is less than 0.05 which means that we can reject the null hypothesis but as the data is statistically significant and the value of R square is 0.756 which indicates that for almost 75% of the times, the value of Sensex can be explained by the changes in the interest rate.

**Findings and Conclusion**

The role of the exchange within the economy is to boost capital and additionally to confirm that the funds raised are used within the most profitable approach. The study shows the connection between rate of interest and exchange. The impact of rate of interest on exchange in India is studied, by using the monthly knowledge from Apr 2005 to March 2014. The study shows the short run and long-term relationship between rate of interest and exchange and it may be seen that there's a major negative relationship between changes in interest rates and exchange. The ways utilized in this study is regression and linear regression. it's clear that the rise within the rate of interest can lead to falling of stock costs due the very fact that top rate of interest can increase the chance value of holding cash, inflicting substitution of stocks for interest bearing securities. rate of interest is one amongst the vital macroeconomic variable and is directly associated with economic process. From the purpose of receiver, rate of interest is that the value of borrowing cash whereas for a loaner, rate of interest is the gain from loaning cash.

## References

- Bhanumurthy, N. R., and Agarwal, S. (2003),” Interest Rate - Price Nexus in India”, Indian Economic Review, 38(2), 189–203.
- Muradoglu G., Metin K. and Argae R. 2001, “Is there a long-run relationship between stock returns and monetary variables: evidence from an emerging market”, Applied Financial Economics VII(6): 641-649.
- Choi, D. and Jen, F. C. (1991), “The Relation Between Stock Returns and Short-Term Interest Rates”, Review of Quantitative Finance and Accounting, Vol. 1, pp. 75-89 [Online] Available at: <http://www.springerlink.com/content/912t8815724k8881/fulltext.pdf>
- SoumyaGuha, Deb and Jaydeep Mukherjee (2008),” Does Stock Market Development Cause Economic Growth/? A Time Series Analysis for Indian Economy”. International Research Journal of Finance and Economics, Issue 21
- Raman K. Agrawalla (2008), “Share Prices and Macroeconomic Variables in India: An Approach to Investigate the Relationship between Stock Markets and Economic Growth”, Journal of Management Research, year 2008,Volume :8, Issue:3
- Pethe, A., and AjitKarnik, (2000), “Do Indian Stock Markets Matter? - Stock Market Indices and Macro-economic Variables”, Economic and Political Weekly, 35 (5), 349-356
- DebabrataMukhopadhyay and Nityananda Sarkar (2003)., “Stock return and macroeconomic fundamentals in model specification framework: Evidence from Indian stock market”., [www.isical.ac.in/~eru/2003-5](http://www.isical.ac.in/~eru/2003-5).
- Fisher, I. (1930). “Theory of Interest.” MacMillan, New York.
- Golaka C. Nath and Dr. V.V. Reddy. (2004), “Macroeconomics Indicators and Stock prices-Indian Evidence”., The ICFAI journal of Applied Finance.

- Gagan Deep Sharma and MandeepMahendru (2010),” Impact of Macro-Economic Variables On Stock Prices in India”, Global Journal of Management and Business Research-Vol,10, Issue 7, pg:19- 26
- Abeyratna G., Anirut P., and David M. P. (2004) “Macro-economic Influences on the Stock Market Evidence from an Emerging Market in South Asia” Journal of Emerging Market Finance, December 2004, Vol. 3, no. 3, 285-304.
- Ajayi R.A. and Mougoue M. (1996) “On the Dynamic Relation between Stock Prices and Exchange rates” The Journal of Financial Research 19, 193-207.
- Avneet K. A., Chandni M., and Saakshi C. (2012) “A Study of the effect of Macroeconomic Variables on Stock Market: Indian Perspective”.
- Chen, N. F., Richard Roll and Stephen A. Ross (1986) “Economic Forces and the Stock Market”, Journal of Business, 59, pp. 383-403.
- Darat, A.F. and Mukherjee T. K. (1987) “The Behaviour of a Stock Market in a Developing Economy”, Economic Letters, 22, 273-278.
- Doong, S.-Ch., Yang, Sh.-Y., Wang, A., (2005) “The dynamic relationship and pricing of stocks and exchange rates: Empirical evidence from Asian emerging markets,” Journal of American Academy of Business, Cambridge, Vol.7, No1, pp.118-23.
- Elton, J. E., Gruber, M. J., Brown, S. J. and Goetzmann, W. N., (2010) “Modern Portfolio Theory and Investment Analysis”, 8th International student edition, John Wiley & Sons.
- Bhatt, V., and Virmani, A. (2005),” Global integration of India's Money Market: Interest rate parity in India”, [Online] Available: <http://www.icrier.org/pdf/wp164.pdf> (February, 1, 2009)
- MahediMasuduzzaman (2012) “Impact of the Macroeconomic Variables on the Stock Market Returns: The Case of Germany and the United Kingdom”, Global Journal of Management and Business Research

- Sarbapriya, Ray (2012) “Foreign Exchange Reserve and its Impact on Stock Market Capitalization: Evidence from India”, *Research on Humanities and Social Sciences*, Vol.2, No.2, 2012
- Uddin, M. G. S. and Alam, M. M. (2007) “The Impacts of Interest Rate on Stock Market: Empirical Evidence from Dhaka Stock Exchange”, *South Asian Journal of Management and Sciences*, 1(2), 123-132
- Arango, L. E., Gonzalez, A. and Posada, C. E. (2002). Returns and interest rate: A nonlinear relationship in the Bogotá stock market. *Applied Financial Economics*, 12(11), 835-842.
- Balaban, E. (1995). Day of the Week Effects: New Evidence from an Emerging Stock Market. *Applied Economics Letters*, 2(5), 139-143.
- Kaul, G. (1990). Monetary Regimes and the relation between stock returns and inflationary expectations. *Journal of Financial and Quantitative Analysis*, 15, 307-321.
- Thompson, A. R. and Ward, M. J. D. (1995). The Johannesburg Stock Exchange as an Efficient Market: A Review. *Journal of Studies in Economics and Econometrics*, 19(3), 33-63.
- Zhou, C. (1996). Stock Market Fluctuations and the Term Structure. Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series: 96/03.
- Mueller, Jim. How Interest Rates Affect the Stock Market. Retrieved from <http://www.investopedia.com/articles/06/interestaffectsmarket.asp>
- Saurabh Singh; Dr. L.K Tripathi; Kirti Lalwani (2002) An Empirical Study Of Impact Of Exchange Rate & Inflation Rate On Performance Of Bse Sensex. *A Journal of Multidisciplinary Research*. Vol.1, (Issue 3), ISSN 2278-0637
- Kantasha Sanningammanavara, Kiran Kumar K and Rakesh H (2014). Macro-Economic Forces and Indian Stock Market: An Empirical Relation. *IRACST – International Journal of Commerce, Business and Management (IJCBM)*, ISSN: 2319–2828 Vol. 3, No. 3, June 2014

- ArchanaUpadhyay. (2016) Causality Relationship Between Interest Rate and Stock Returns in India- An Analytical Study. UpadhyayApeejay- Journal of Management Sciences and Technology, 4(1), October-2016 ISSN-2347-5005
- Mohanamani. P, Dr. T. Sivagnanasithi. (2014) Indian Stock market and Aggregate macroeconomic variables: Time Series Analysis. IOSR Journal of Economics and Finance (IOSR-JEF) e-ISSN: 2321-5933, p-ISSN: 2321-5925. Volume 3, Issue 6. (May-Jun. 2014), PP 68-74

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