

Interest Rate and Stock Prices – Evidence from Indian Stock Market with Special Reference to BSE

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Abstract - This paper analyses the relationship between interest rates and stock prices in the context of India. The objectives of the paper are to investigate the impact of interest rates on stock prices and build a model for forecasting stock prices based on interest rates. Karl Pearson's coefficient of correlation and linear regression model have been applied on the time series data of eleven sectoral indices published by Bombay Stock Exchange and Bank rates published by Reserve Bank of India for a 18 year period from April 2000 and March 2018. Karl Pearson's coefficient of correlation is tested for significance and coefficient of determination is also computed to assess the extent of fit of the regression model in forecasting the stock prices. The results show that six sectors (auto, bank, FMCG, finance, IT and Healthcare) out of eleven sectors were significantly impacted by the interest rate. The overall market represented by the market index (Sensex 30) was also impacted by the interest rate.

Key Words: Interest rate, Stock prices, Karl Pearson's coefficient of correlation, Linear Regression Model

1. INTRODUCTION

Stock markets play an important role in the financial sector development of any economy, especially in developing economies. An efficient capital market can promote economic growth by providing long term investment opportunities that will attract both domestic and foreign capital. Interest-rate is a vital tool of monetary policy and is taken into account when dealing with macroeconomic variables like investment, inflation, and unemployment. This paper aims to investigate the relationship between interest rates and stock prices from the perspective of India. Theoretically one may hypothesise that macroeconomic variables impact stock prices. In isolation interest may impact the stock prices. So the present study is aimed to evaluate and analyze the impact of Interest rate on Stock prices in India.

2. REVIEW OF LITERATURE

The relationship between stock market and various economic factors such as interest rate, inflation rate etc. have been examined by researchers as they play an important role in influencing a country's economic development. Interest rates are determined by monetary policy of a country according to its economic situation. High interest rates will prevent capital outflows, hinder economic growth and consequently hurt the economy as interest rate is one of the most important factors affecting directly the growth of an economy. In the light of external factors gaining importance, some studies have been conducted to understand the relationship and quantify the impact. Some significant studies have been reviewed here.

Uddin and Alam (2009) in their study 'Relationship between interest rate and stock price: Evidence from developed and developing countries' seek evidence supporting the existence of share market efficiency based on the monthly data from January 1988 to March 2003. In their study they show empirical relationship between stock index and interest rate for fifteen developed and developing countries using time series and panel regression. They also show that for all of the countries interest rate has significant negative relationship with share price and for six countries changes of interest rate has significant negative relationship with changes of share price.

Senthil Kumar (2013) in his study 'Effect of interest rate changes on stock returns of select Indian commercial banks' investigates the long term effects of repo rate changes on seven public sector banks and six private sector banks using regression technique. He found that any increase in the interest rate adversely affects the bank stock returns.

Faff, Hodgson and Kremmer (2005) analyse the dual impact of changes in the interest rate and interest rate volatility on the distribution of Australian financial sector stock returns. In addition, a multivariate GARCH- M model is used to analyze the impact of deregulation on the financial institutions sector. It was found that there is a consistent inter temporal tradeoff between risk and return over the different regulatory periods. Moreover, finance corporations were found to be highly sensitive to new shocks across the financial sector and deregulation increased the risk faced by finance corporations and small banks – effectively increasing the required rate of return and explain the continued rationalization of these sectors.

Muthukumaran and Somasundaram (2014) in their study ‘An analytical study of interest rate and stock returns in India’ estimate causality relationship between interest rate and stock returns. Using the Granger Causality test they found that there exists a short term relationship among the interest rate and stock returns. Their study implies that the interest rate neither affects stock returns nor stock returns affect the interest rate.

Uddin and Alam (2010) in their study ‘The impact of interest rate on stock market: Empirical evidence from Dhaka stock exchange’ show empirical relationship between stock index and interest rate in Bangladesh based on monthly data from 1992 to June 2004. They tested the stationary of market return and found that the DSE index does not follow a random walk model, which indicated that DSE is not efficient in weak form. They determine the linear relationship between share price and interest rate, share price and growth of interest rate, growth of share price and interest rate, and growth of share price and growth of interest rate through ordinary least-square (OLS) regression. They found that interest rate has a significant negative relationship with growth of share price.

3. OBJECTIVES OF THE STUDY

1. To investigate the impact of interest rate on stock prices
2. To develop a model for forecasting stock prices based on interest rate

4. HYPOTHESIS

H₀: Interest rate has no impact on stock prices

H₁: Interest rate has an impact on stock prices

5. DATA AND METHODOLOGY

This study focuses on the impact of the interest rate on stock prices. The period under investigation is 18 years i.e., from April 2000 to March 2018. Hence the bank rates and closing prices of the sectoral indices from 2000-18 are considered for the research.

Eleven sectors (auto, bank, energy, FMCG, finance, IT, Oil & Gas, metal, Healthcare, Telecom, realty) and one market index (Sensex 30) are selected and sectoral indices are collected for those respective sectors. The closing prices of these sectoral indices were considered and then correlated with interest rates to find out the correlation between the two variables i.e., interest rates and closing prices. These sectoral indices were collected from the database of Bombay Stock Exchange. Bank rates were collected from the database of RBI.

The statistical tool used for testing of the hypothesis is Karl Pearson’s coefficient of Correlation.

Linear Regression has been used to develop a model for forecasting stock prices based on interest rate.

6. ANALYSIS, DISCUSSION AND RESULTS

The null and alternative hypothesis are formed in respect of each of the sector indices included in the sample. Correlation coefficient is found between the such indices over the sampling period and the interest rate. The hypothesis is either accepted or rejected based on the results of the significance test. The results of this data analysis are shown in Table 1.

Table 1: Karl Pearson’s coefficient of Correlation for S&P Sensex 30 and the other Indices

	Index	Hypothesis	r	Significance At .05 level (2 tailed)	Hypothesis accepted or rejected
1.	S&P Sensex 30 and Auto	H ₀ : Interest rate has no impact on S&P Sensex 30 and Auto H ₁ : Interest rate has an impact on S&P Sensex 30 and Auto	.817	Significant	Rejected
2	S&P Sensex 30 and Bankex	H ₀ : Interest rate has no impact on S&P Sensex 30 and Bankex H ₁ : Interest rate has an impact on S&P Sensex 30 and Bankex	.746	Significant	Rejected

3	S&P Sensex 30 and Energy	H ₀ : Interest rate has no impact on S&P Sensex 30 and Energy H ₁ : Interest rate has an impact on S&P Sensex 30 and Energy	.114	Insignificant	Accepted
4	S&P Sensex 30 and FMCG	H ₀ : Interest rate has no impact on S&P Sensex 30 and FMCG H ₁ : Interest rate has an impact on S&P Sensex 30 and FMCG	.921	Significant	Rejected
5	S&P Sensex 30 and Finance	H ₀ : Interest rate has no impact on S&P Sensex 30 and Finance H ₁ : Interest rate has an impact on S&P Sensex 30 and Finance	.740	Significant	Rejected
6	S&P Sensex 30 and IT	H ₀ : Interest rate has no impact on S&P Sensex 30 and IT H ₁ : Interest rate has an impact on S&P Sensex 30 and IT	.696	Significant	Rejected
7	S&P Sensex 30 and Telecom	H ₀ : Interest rate has no impact on S&P Sensex 30 and Telecom H ₁ : Interest rate has an impact on S&P Sensex 30 and Telecom	.359	Insignificant	Accepted
8	S&P Sensex 30 and Metal	H ₀ : Interest rate has no impact on S&P Sensex 30 and Metal H ₁ : Interest rate has an impact on S&P Sensex 30 and Metal	-0.158	Insignificant	Accepted
9	S&P Sensex 30 and Healthcare	H ₀ : Interest rate has no impact on S&P Sensex 30 and Healthcare H ₁ : Interest rate has an impact on S&P Sensex 30 and Healthcare	0.845	Significant	Rejected
10	S&P Sensex 30 and Oil & Gas	H ₀ : Interest rate has no impact on S&P Sensex 30 and Oil & Gas H ₁ : Interest rate has an impact on S&P Sensex 30 and Oil & Gas	0.386	Insignificant	Accepted
11	S&P Sensex 30 and Realty	H ₀ : Interest rate has no impact on S&P Sensex 30 and Realty H ₁ : Interest rate has an impact on S&P Sensex 30 and Realty	-0.443	Insignificant	Accepted

Source: Output of Karl correlation from eviews

Regression equation is constructed for forecasting each of the indices. Further R² is also computed for estimating the utility of the forecast model. The results of this data analysis are shown in Table 2.

Table 2 Regression Equation for S&P Sensex 30 and the other indices

	Index	Regression equation	r ²	Model usefulness ? Yes/No
1.	S&P Sensex 30 and Auto	Y=1224.34 X - 4766.42	0.6680	No
2	S&P Sensex 30 and Bankex	Y= 2247.68 X - 5773.48	0.5569	No
3	S&P Sensex 30 and Energy	Y= 164.29 X + 6716.91	0.0129	No
4	S&P Sensex 30 and FMCG	Y= 3633.65 X - 14963.6	0.8479	Yes
5	S&P Sensex 30 and Finance	Y = 911.76 X - 2330.44	0.5468	No
6	S&P Sensex 30 and IT	Y = 1293.94 X - 2641.27	0.4846	No
7	S&P Sensex 30 and Telecom	Y = 152.31 X + 629.70	0.1289	No
8	S&P Sensex 30 and Metal	Y = -163.53 X + 4147.16	0.0250	No
9	S&P Sensex 30 and Healthcare	Y = 1645.21 X - 6454.73	0.7132	No
10	S&P Sensex 30 and Oil & Gas	Y = 272.38 X + 1096.29	0.1487	No
11	S&P Sensex 30 and Realty	Y = -157.14 X + 1626.03	0.1959	No

Source: Output of Regression Equation from Eviews.

7. CONCLUSION

The analysis of data and discussions show that there is an impact of interest rate on stock prices. From the data analysis it is found that six sectors- auto, bank, FMCG, finance, IT, Healthcare- out of eleven sectors and one market index (Sensex 30) were significantly impacted by the interest rate. Five sectors which did not show significant correlation with interest rate were energy, Telecom, metal, Oil & Gas and realty.

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