

Nifty 50: Caused by FDI, WPI and Exchange Rate?

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ABSTRACT

The Indian stock market does not move in isolation and its returns are dependent upon economic parameters. The later play a pivotal role in influencing the returns for markets. An investor who plugs his money in the stock market may take into account the fluctuations in such factors and accordingly plan his/her portfolio. Index returns may have a causal association with many factors in the economy; inflation rates, interest rates, foreign direct investment flows, exchange rate mechanism, gross domestic product, monetary policy of central bank, crude oil prices to name a few. All of them may together contribute towards volatility in stock returns. Thus, while designing strategies of investment due relevance must be given to them. This relationship has been tested in various time frames by taking a combination of different exogenous factors in short run and long run. The present study is emphasized to establish association between change in the four variables and their causal linkages in the short run. It has been observed using Granger Causality that all the variables have causal relationship during the short run.

Keywords: Granger causality, Nifty 50, FDI growth, Inflation & Exchange Rate.

I INTRODUCTION

National Stock Exchange (NSE) was established in India with its headquarters at Mumbai. It is the most popular stock exchange out of the 23 stock exchanges in India. Though it was started after Bombay Stock Exchange (BSE) but due to the ease, convenience and other facilities NSE became more popular amongst investors than BSE. The main index which reflects the performance and growth for this exchange is Nifty 50. The daily closing values of this index and their returns may be dependent upon many factors. These could be macro, micro or company specific. The number of scrips included in this index generally remain 50 but presently there are 51 scrips which are the base for evaluating the performance.

The aim of the present study is to find out whether Nifty 50 is caused by macroeconomic factors during the short run. This analysis has been carried with the help of Granger Causality test which was first proposed in the year 1969. It examines whether a particular variable let's say X causes the other variable Y or not.

II LITERATURE REVIEW

(Elly & Oriwo, 2012) The study investigated using regression analysis impact of macroeconomic variables (lending rate, inflation rate, 91 days T-bills rate with Nairobi Stock Exchange index. There was a weak positive relationship between inflation and market performance. On the other hand 91 days T-bill depicted a negative correlation during March 2008-2012 (monthly).

Srinivasan & Karthigai (2014) The domestic gold prices were not found significant in forecasting stock prices in India. There was no causal linkage between gold prices and stock prices or vice versa in the short run. Using autoregressive distributed lag bounds testing approach and granger causality test from June 1990 to April 2014 (monthly) it was concluded that

there were no significant association between variables.

(Aggarwal & Saqib, 2017) Nifty 50 was found to be significantly affected by US GDP, S&P 500, gold prices, Indian WPI, fiscal deficit and exchange rate. Multiple regression results from 2001-2016 (monthly) showed the impact of macroeconomic variables on the Indian stock market.

(Dharmaraj, 2010) S & P CNX Nifty index movements were found to be influenced by FIIs during 2006-2009 (monthly). However, the stock market volatility showed lesser impact from FIIs. Using linear regression model and pearson correlation results were found indicating dependence. The study had broken the data into different structures based on bull phase, recessionary phase, swinging phase to name a few to minutely locate the impact of FIIs.

(Mishra & Singh, 2012) The study analyzed the data of monthly stock returns from BSE and NSE as dependent variables with inflation, exchange rate, IIP, FII and interest rates as independent factors. It was depicted that from November 1998 to July 2008 (monthly) GAM (Generalized Additive Model) was better fitted than OLS (Ordinary Least Square Method) for predicting returns of stock markets from the selected macroeconomic variables.

(Liu & Shrestha, 2008) Macroeconomic variables (money supply, industrial production, inflation, exchange rate and interest rates) were tested for co-integrating relationship between indices of China's stock market during January 1992 to December 2001 (monthly). It was found using JJ, OLS and GARCH model that the variables were move together in the long run. IP and MS had positive relationship but rest of the variables showed negative relationship.

(Lee et al., 2001) Malaysian stock market was tested for both short and long run relationship with macroeconomic variables (interest rates, money supply, industrial production, inflation, exchange rates and trade balance). It was found that both stock market index was co-integrated with other variables

in both short and long run using co-integration analysis (VAR model) during 1987-1997.

(Gallagher & Taylor, 2002) The study analyzed stock price behavior with demand and supply macroeconomic shocks during 1949-1997 with appropriate structural breaks. VAR model had been used to conclude that the demand shocks resulted into temporary effects while supply side showed a permanent impact.

(Schwert, 1989) The association between monthly stock returns with other variables (bond returns, inflation, interest rate, industrial production and money growth) were tested between 1857 to 1987 using squared standard deviations (similar to ARCH model). It was found that during the Great Depression (1929-1939) stock market volatility went unusually high.

III RESEARCH METHODOLOGY

Primarily, in this study Granger causality between variables has been analysed with the help of EViews software. The precondition for testing this causality between variables is that the data should be stationary. The process for testing stationarity was completed with the help of Augmented Dickey-Fuller test (unit root test) with intercept, with trend and without trend at level, first difference and second difference at 5% level of significance.

The data for the study included monthly data from January 2009 to March 2018 (thus, taking the data

after recession was over in the year 2008). The monthly data for Nifty 50, foreign direct investment, wholesale Price inflation and exchange rate was taken from the websites of National Stock Exchange, Department of Industrial Policy and Promotion and Reserve Bank of India. This data was further converted into growth series to assess for change/increase in the variables. Granger causality test was then applied to find out causal relationships between variables in EViews.

IV ANALYSIS & INTERPRETATION

The analysis and results have been divided into two segments. The first segment explains the test for stationarity at level, first difference and second difference with intercept, with trend and without trend and the second segment explains the results of Granger Causality. As the data was found stationary at $I(0)$ i.e. the problem of unit root was not present, Granger Causality test was applied to check for causal linkages moving between the variables in the short run.

(a) Unit root test

The monthly data for growth in FDI, increase in WPI, change in Exchange rate and Nifty 50 returns with 108 observations was tested for unit root using Augmented Dickey-Fuller test in EViews as a precondition to check Granger Causality. The results have been discussed with the help of following tables and interpretation:

Table 1

Augmented Dickey-Fuller Statistics (at Level with intercept)

Variable	t-statistic	Prob.
FDI	-8.961	0.000
WPI	-10.143	0.000
Ex R	-7.931	0.000
Nifty 50	-9.255	0.000

The table above shows the t-statistic for all variables and their corresponding p-values which reflect that the null hypothesis (Variables contain a unit root)

may be rejected. Hence, it may be said that the variables were stationary at level.

Table 2

Augmented Dickey-Fuller Statistics (at first difference with intercept)

Variable	t-statistic	Prob.
FDI	-9.555	0.000
WPI	-10.109	0.000
Ex R	-9.414	0.000
Nifty 50	-7.867	0.000

The above table shows the results for unit root test at first difference with intercept. It may be said that as per the statistics and p-values that data was found to

be stationary at first difference also. Thus, null hypothesis may be rejected in this case.

Table 3
Augmented Dickey-Fuller Statistics (at second difference with intercept)

Variable	t-statistic	Prob.
FDI	-8.010	0.000
WPI	-8.759	0.000
Ex R	-7.549	0.000
Nifty 50	-7.060	0.000

Table 3 shows the results of unit root test at second difference with intercept indicating absence of unit root. As a result, null hypothesis may be rejected.

Table 4
Augmented Dickey-Fuller Statistics (at level with trend)

Variable	t-statistic	Prob.
FDI	-8.941	0.000
WPI	-10.451	0.000
Ex R	-7.851	0.000
Nifty 50	-9.364	0.000

The above table shows the statistics for unit root test performed at level with trend with their corresponding p-values. It explains that the null

hypothesis may be rejected and it may be said that the data was stationary.

Table 5
Augmented Dickey-Fuller Statistics (at first difference with trend)

Variable	t-statistic	Prob.
FDI	-9.51	0.000
WPI	-10.06	0.000
Ex R	-7.765	0.000
Nifty 50	-7.972	0.000

The table 5 above narrates the results of unit root test performed at first difference with trend showing the

absence of unit root in the data. Therefore, null hypothesis may be rejected.

Table 6
Augmented Dickey-Fuller Statistics (at second difference with trend)

Variable	t-statistic	Prob.
FDI	-7.958	0.000
WPI	-8.713	0.000
Ex R	-7.601	0.000
Nifty 50	-7.021	0.000

Table 6 above explains the results for unit root test at second difference with trend. It indicates that the null

hypothesis may be rejected and it may be said that the data was stationary.

Table 7
Augmented Dickey-Fuller Statistics (at level without trend)

Variable	t-statistic	Prob.
FDI	-14.144	0.000
WPI	-10.189	0.000
Ex R	-7.842	0.000
Nifty 50	-8.692	0.000

Table 7 above explains the results of unit root test at level without trend. It shows that the data was stationary and the null hypothesis may be rejected.

Table 8
Augmented Dickey-Fuller Statistics (at first difference without trend)

Variable	t-statistic	Prob.
FDI	-9.605	0.000
WPI	-10.158	0.000
Ex R	-9.461	0.000
Nifty 50	-7.895	0.000

The table above shows the results of unit root test at first difference without trend. It may be observed from p-values which in all variables have been found to be less than 5% meaning that null hypothesis may be rejected and data was stationary.

Table 9
Augmented Dickey-Fuller Statistics (at second difference without trend)

Variable	t-statistic	Prob.
FDI	-8.062	0.000
WPI	-8.806	0.000
Ex R	-7.592	0.000
Nifty 50	-7.104	0.000

Table 9 above narrates the results of unit root test and their corresponding p-values. It indicates that the null hypothesis may be rejected at 5% level of significance meaning that the data was stationary.

(b) Granger Causality test

This segment explains the results of Granger Causality test carried in EViews at 5% level of significance to determine the causal linkages between all variables in the short run. Primarily the following equation may be produced to check the causal effects of FDI, WPI and Exchange Rate with Nifty 50 returns.

$$Nifty\ 50 = f(FDI, WPI, EXR)$$

- where, Nifty 50 = Returns on market index
- FDI = Increase in foreign direct investment
- WPI = Change in Wholesale price index
- EX R = Change in Exchange Rate

The table below demonstrates the results with each variable among the other. It may be observed from the results that in the short run Nifty 50 may not be caused by the three variables taken in the study (FDI, WPI and Exchange Rate). Thus, null hypothesis (X does not cause Y in the short run) may not be rejected while testing causal links among all variables except one being all the corresponding p-values are greater than 5%. In case of testing whether Nifty 50 can cause WPI, it was observed that the p-value was 0.015 meaning that the null hypothesis may be rejected at 5% level of significance. Thus, it may be said that some linkage existed during short run. Thus, it may be said that there is a possibility that in the short run these variables may be having weak associations or no relationship in the short run but in the long run they may resume to equilibrium. This calls for further testing them in the long run. It may be done with more macroeconomic variables and other benchmark indices may also be included in the study.

Table 10
Granger Causality Results

Null Hypothesis	F-Statistic	Prob.
FDI does not Granger Cause Exchange Rate	1.070	0.347
Exchange Rate does not Granger Cause FDI	0.434	0.649
Nifty 50 does not Granger Cause Exchange Rate	0.491	0.613
Exchange Rate does not Granger Cause Nifty 50	1.162	0.317
WPI does not Granger Cause Exchange Rate	1.058	0.351
Exchange Rate does not Granger Cause WPI	0.150	0.861
Nifty 50 does not Granger Cause FDI	0.245	0.783
FDI does not Granger Cause Nifty 50	0.583	0.561
WPI does not Granger Cause FDI	0.476	0.623
FDI does not Granger Cause WPI	0.492	0.613
WPI does not Granger Cause Nifty 50	0.183	0.833
Nifty 50 does not Granger Cause WPI	4.371	0.015*

V CONCLUSION

To conclude, it may be said that in the short run the variables in the study (Nifty 50, FDI, WPI, Exchange Rate) may not be in equilibrium. Though few linkages were found between Nifty 50 and WPI but they may not be strong enough to forecast Nifty 50 returns from WPI or vice versa. It may only indicate that these variables may become strongly associated in the long run. It may be deduced that in the short run it may be difficult to form any linkages between the variables and thereby forecasting them with each other. This may call for another study which can take a holistic view of these variables in the long run. More variables from the economy that may influence stock market returns may be taken under consideration and may be tested for association in the long run.

REFERENCES

- [1] Aggarwal, Priyanka. & Saqib, Najia. (2017). Impact of Macro Economic Variables of India and USA on Indian Stock Market. *International Journal of Economics and Financial Issues*, 7(4), PP.10-14.
- [2] Aijaz, Urooj and Faisal, Muhammad, and Meraj, saad. (2016). Impact of Oil and Gold Prices on stock Market index. *Journal of Business Strategies*, 10(2), PP.69-84.
- [3] Bahmani-Oskooee, Mohsen and Saha, Sujata. (2015). On the relation between stock prices and exchange rates: a review article. *Journal of Economic Studies*, 42 (4), PP.707-732.
- [4] Chakrabarty, Ranajit & Sarkar, Asima. (2013). The Effect of Economic Indicators on the Volatility of Indian Stock Market: Using Independent Component Regression. *Journal of Contemporary Research in Management*, 8(4), PP.1-22.
- [5] Das, Niladri & Pattanayak, J K. (2013). The Effect of Fundamental Factors on Indian Stock Market: A Case Study of Sensex and Nifty†. *The IUP Journal of Applied Finance*, 19(2), PP.84-99.
- [6] Dharmaraj, C. (2003). Measuring the Impact of Foreign Institutional Investments on S&P CNX Nifty - A Pragmatic Study. *Anvesha*, 4(1), PP.45-56.
- [7] Elly, Ochieng Duncan. & Oriwo, Adhiambo Eunice. (2012). The relationship between macroeconomic variables and stock market performance in Kenya. *DBA Africa Management Review*, 3(1), PP.38-49.
- [8] Gallagher, Liam & P. Taylor, Mark. (2002). Permanent and Temporary components of stock prices: Evidences from assessing the macroeconomic shocks. *Southern economic journal AIB/INFORM collection*, 62(2), PP.345-362.
- [9] Gan, Christopher & Lee, Minsoo & Hua Hwa Au Yong and Zhang, Jun. (2016). Macroeconomic Variables and Stock Market Interactions: *New Zealand Evidence. Investment Management and Financial Innovations*, 3(4), PP.89-101.
- [10] Habib, Mohsina & Ul Islam, Khalid. (2017). Impact of Macroeconomic variables on Islamic Stock Market Returns: Evidence from NIFTY 50 Shariah Index. *Journal of Commerce & Accounting Research*, 6(1), PP.37-44.
- [11] Kumari, Jyoti & Mahakud, Jitendra. (2014). Relationship Between Conditional Volatility of Domestic Macroeconomic Factors and Conditional Stock Market Volatility: Some Further Evidence from India. *Springer Japan, Asia-Pacific Finan Markets*, 22, PP.87-111.

- [12] Kumari, Jyoti. (2011). Stock Returns and Inflation in India: An Empirical Analysis. *The IUP Journal of Monetary Economics*, IX (2), PP.39-75.
- [13] Lee Lee, Chong & Boon, Tan Hui & Baharumshas, Ahmad Zubaidi. (2001). The stock market, macroeconomic fundamentals and economic growth in Malaysia. *Asia Pacific journal of economics and business*, 5 (2), PP.44-55.
- [14] Liu, Ming-Hua & M. Shrestha, Keshab. (2008). Analysis of the long-term relationship between macroeconomic variables and the Chinese stock market using heteroscedastic co-integration. *Managerial Finance*, 34 (11), PP.744-755.
- [15] M. Al-Khazali, Osamha & Soo Pyun, Chong. (2004). Stock process and inflation: New evidence from the pacific basin countries. *Review of finance and accounting*, 22, PP.123-140.
- [16] M. C, Minimol & K. G, Makesh. (2017). Effect of International Financial Flows on Indian Stock Market Indices: A Time Series Analysis. *Splint International Journal of Professionals*, IV (6), PP.63-74.
- [17] Mangala, Deepa & Rani, Anita. (2015). Revisiting the Dynamic Relationship between Macroeconomic Fundamentals and Stock Prices: An Evidence from Indian Stock Market. *International Journal of Financial Management*, 5, PP.53-63.
- [18] Mishra, Sagarika & Singh, Harminder. (2010). Do macro-economic variables explain stock-market returns? Evidence using a semi-parametric approach. *Journal of Asset Management*, 13(2), PP.115-127.
- [19] Ms. Indumathi, M. & Dr. Pakutharivu, N... December. (2013). A Study on the impact of volatility in exchange rate of Indian Rupee versus Dollar on Indian capital market. *Summer Internship Society*, IV (2), PP.47-62.
- [20] Panwar, Vivek & Nidugala, Ganesh. (2017). Indian Stock Market Reaction to Interest rate and Inflation announcements. *19th International Scientific Conference on Economic and Social Development Melbourne*, PP.424-434.
- [21] Patel, Samveg A. (2013). Causal Relationship Between Stock Market Indices and Gold Price: Evidence from India. *The IUP Journal of Applied Finance*, 19(1), PP.99-110.
- [22] Schwert, G. William. (1989). Why Does Stock Market Volatility Change Over Time? *The Journal of Finance*, XLIV (5), PP.1015-1152.
- [23] Siddiqui, Saif & Seth, Neha. (2015). Do Global Oil Price Changes Affect Indian Stock Market Returns? *Journal of Management & Public Policy*, 6(2), PP.29-41.
- [24] Srinivasan, P. & Karthigai, Prakasan. (2014). Gold Price, stock price & exchange rate Nexus: The Case of India. *IUP Journal of Financial Risk Management*, XI (3), PP.52-63.
- [25] Srivastava, Aman. 2010. Relevance of Macro Economic factors for the Indian Stock Market. *Decision*, 37(3), PP.69-89.
- [26] T. Ewing, Bradley. (2002). Macroeconomic news and the return of financial companies. *Managerial and Decision Economics*, 23(8), PP.439-446.
- [27] Thenmozhi, M & Srinivasan, N. (2015). Comovement of oil price, Exchange rate and stock Index of major oil Importing Countries: A Wallet Coherence Approach. *The Journal of Developing Areas*, 50(5), PP.85-102.