



REVIEW OF RESEARCH

ISSN: 2249-894X

IMPACT FACTOR : 5.7631 (UIF)

UGC APPROVED JOURNAL NO. 48514

VOLUME - 8 | ISSUE - 9 | JUNE - 2019



IMPACT OF IIP AND WPI OF MACRO ECONOMIC VARIABLES ON STOCK MARKET PERFORMANCE IN INDIA – WITH REFERENCE TO SENSEX AND NIFTY

Sindhu R.¹ and Dr. K. Soundarajan²

¹ Ph.D. Research Scholar, Department of Business Administration, Annamalai University, Tamilnadu.

² Associate Professor, Department of Business Administration, Annamalai University.

ABSTRACT:

The study attempted to know the relationship and impact of two macro economic variables namely IIP and WPI on the movements of Indian stock market in terms of the indices Sensex of BSE and Nifty of NSE during the period of 12 years from April 2005 to March 2017. It used secondary data. The study collected time series data namely, indices of Sensex and Nifty, Index of Industrial Production (IIP) and Wholesale Price Index (WPI) during the period of study. The researchers used descriptive statistics, correlation analysis, ADF Unit Root Test, Johansen Co-integration Test and Granger Causality Test for analysis. The study evidenced that there was no significant relationship between IIP, WPI with Indian stock market both in terms of Sensex and Nifty as shown by the results of Correlation analysis. The study found unit root on all the selected factors (IIP, WPI, Sensex and Nifty) during the study period, in other words these factors were non-stationary during the period of study. As per the results of Johansen co-integration test, no co-integration relationship was found between IIP, WPI and Indian stock market. Similarly, both the selected macro economic factors, IIP and WPI did not have granger cause on the movements of Indian stock market (Sensex and Nifty) and the movement of Indian stock market also did not have granger cause on these macro economic factors during the period of study.



KEYWORDS: Stock market, Macro economic factors, granger cause, co-integration, unit root.

INTRODUCTION:-

Stock market is one of the unavoidable components of Indian financial system. It helps the economy in several ways, it paves way for economic development through channelizing capital from investors to industrialists, it helps investors by giving fair returns, it helps other financial institutions like banks, financial

institutions and so on. Stock exchange is the place where the shares and other financial instruments are transacted. Stock exchanges are the privately organized organization, where shares and other securities are bought and sold by members. Indian stock market is one of the oldest in Asia. Bombay Stock Exchange (BSE) and National Stock

Exchange (NSE) are leading stock exchanges in India. Out of total transactions in all recognized stock exchanges, more than 99.5 per cent of transactions are being done in these to exchanges. Both BSE and NSE are in the top 20 stock exchanges in the world in terms of market capitalization. Hence Indian stock markets have very rich history and growth. This is the place, which attracts

more investors both from host country and foreign countries, since stock market gives fair and some time high returns to the investments than any other type of investments in the country.

The stock market movements are caused by various factors. Company related factors are affecting share prices of the particular company, these factors includes both financial and non-financial factors. Industry related factors are affecting share price of the companies belong to the industry. Macro economic factors are playing pivotal role in influencing the movements of stock market in India. Understanding the macro economic factors, which are influencing more on stock movements and the direction of impact, will help an investor to take right decisions in investments in stock market. Hence the researcher has undertaken the study to analyse the impact of Index of Industrial Production (IIP) and Wholesale Price Index (WPI) on the movement of Indian stock market.

LITERATURE REVIEW

Dharmendra Singh (2010) found in his study that the stock market index, the industrial production index, exchange rate, and wholesale price index contained a unit root and were integrated of order one. The results of Granger causality test indicated that IIP was the only variable having bilateral causal relationship with BSE Sensex. WPI had strong correlation with Sensex. Ashish Kumar (2011) found that there was no co integration between Nifty and all other variables except Wholesale price index (WPI). It was also found that Nifty did not Granger Cause WPI and WPI also did not Granger Cause Nifty. MohdYahyaMohdHussin et al (2012) evidenced that that stock prices were co-integrated with the selected macroeconomic variables in which the stock price was related positively and significantly with IPI and CPI variables but related negatively and significantly with M3 and MYR variables. Samveg Patel (2012) evidenced long run relationship between selected macroeconomic variables and stock market indices. The study also revealed causality run from exchange rate to stock market indices to IIP and Oil Price. BhanuSireesha (2013) found that gold and silver prices had positive relationship with behaviour of Indian stock market. The study also found that stock returns were significantly influenced by inflation, GDP, USD-INR and JPY-INR. GDP shows a direct relation with stock return and an inverse relation with gold and silver returns. Poojasingh (2014) evidenced significant impact of macroeconomic variables on Indian stock market. The gold prices, exchange rate had negative impact on the stock market. Foreign investment and money supply had significant positive impact on the stock market.

OBJECTIVES

The study was undertaken with the following objectives.

- To study the relationship between IIP, WPI with Indian stock market and
- To study the impact of IIP and WPI on the movement of Indian stock market.

METHODOLOGY

The study was analytical in nature. It used secondary data. The study required time series data namely, index of Sensex and Nifty, Index of Industrial Production (IIP) and Wholesale Price Index (WPI). These data were collected for the period of 12 years from April 2005 to March 2017. The IIP data were collected from the official website of Reserve Bank of India, WPI data were collected from World Bank website and index data were collected from official websites of the concerned stock markets. The researchers used descriptive statistics, correlation analysis, ADF Unit Root Test, Johansen Co-integration Test and Granger Causality Test for analysis. Descriptive statistics was employed, Kurtosis and Skewness test were used to test the shape of distribution and Jarque-Bera test was applied to test whether the data were normally distributed. For to purpose of testing stationarity of selected indices, Augmented Dickey Fuller (ADF) Unit root test was applied. This test was made whether the time series data is stationary or not. The researchers have also applied Johansen co-integration test after confirming that the considered indices had unit root (non-stationary) by applying ADF unit root test. The test is made to examine co-integration relationship between Indian stock market and selected macro economic factors. It also explores the long-run equilibrium relationship among the time series variables. If two variables are co-integrated, it means they would not drift apart over a period of time on

an average. This test gives the results whether two variables co-integrate or not, so the study has also employed Granger causality test to examine causal relationship between two time series data. In this study the test has been applied to know causal relationship between Indian stock market and selected foreign markets. This test gives results of among two variables, which variable causes another one. The model used to calculate ADF Unit root test is presented below (Gujarati, 2003).

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta y_{t-1} + \sum_{i=1}^m a_i \Delta y_{t-i} + \varepsilon_t \quad \dots\dots\dots (1)$$

Where ε_t is error term, Y_t is a random walk with drift around a stock trend, 't' is current day, 't-1' is previous day, 'm' is the lag order of the first difference autoregressive process, β is the coefficient on a time trend,

The model used to calculate Johansen co-integration test between Indian stock market and foreign stock markets is as follows.

$$\lambda trace(r) = -T \sum_{i=r+1}^n \log(1 - \lambda_i) \quad \dots\dots\dots (2)$$

$$\lambda trace(r, r + 1) = -T \log(1 - \lambda_{r+1}) \quad \dots\dots\dots (3)$$

- r = number of separate series
- T = number of usable observations
- λ = estimated eigen values

The models used to calculate Granger causality test is presented below.

$$IM_t = \sum_{i=1}^n a_i ME_{t-i} + \sum_{j=1}^n \beta_j IM_{t-j} + u_{1t} \quad \dots\dots\dots (4)$$

$$ME_t = \sum_{i=1}^n \lambda_i ME_{t-i} + \sum_{j=1}^n \delta_j IM_{t-j} + u_{2t} \quad \dots\dots\dots (5)$$

Where, IM is Indian market, ME is Macro Economic factors, u_{1t} and u_{2t} are error term and assumed that they are uncorrelated, 'n' is the maximum number of lagged observations and λ are the parameters to be estimated.

RESULTS AND DISCUSSION

The study assessed the impact of macro economic variables viz., IIP and WPI on the movement of Indian stock market. For this purpose descriptive statistics was made and the results are presented in table 1.

Table 1: Descriptive Statistics

	SENSEX	NIFTY	IIP	WPI
Mean	18188.11	5468.54	265.37	147.12
Median	17700.90	5312.50	288.90	148.10
Maximum	29361.50	8901.85	451.90	185.90
Minimum	6154.44	1902.50	140.20	102.50
Std. Dev.	5918.57	1812.48	99.31	28.13
Skewness	0.11	0.17	0.09	-0.11
Kurtosis	2.28	2.25	1.35	1.47
Jarque-Bera	3.36	4.02	16.24	13.99
Probability	0.19	0.13	0.00	0.00
Observations	144	144	144	144

Source: Computed from Secondary Data

It was observed from table 1 that there was moderate level of deviation in selected indices and macro economic variables from the mean value as shown by the results of SD. The calculated values of Skewness of Sensex and Nifty were 0.11 and 0.17 respectively, these values were 0.09 and -0.11 for IIP and WPI. These values are little higher than zero, hence these factors are normally distributed. The value of Skewness of WPI was negative, hence it was negatively skewed and there are more chances for negative return. Other factors were positively skewed, here there are more chances for positive returns. The calculated values of Kurtosis of Sensex and Nifty were 2.28 and 2.25 respectively, they are near 3, hence they indicates normal distribution. On the other hand, the calculated values of Kurtosis were 1.35 and 1.47 respectively for IIP and WPI, they were less than 3, hence these factors were less peaked than normal distribution. The calculated values of Jarque-Bera test were 3.36 and 4.02 for Sensex and Nifty and they were not statistically significant as shown by P-values, hence they were normally distributed. On the other hand the calculated values of Jarque-Bera test were 16.24 and 13.99 respectively for macro economic variables IIP and WPI and they were statistically significant as shown by the result of P-value, hence they were not normally distributed.

Table 2 brings out the results of correlation between selected macro economic factors and Indian stock market in terms of Sensex and Nifty.

Table 2: Correlation Analysis

	SENSEX		NIFTY	
	Correlation	P value	Correlation	P value
IIP	0.030	0.723	0.038	0.654
WPI	0.038	0.655	0.010	0.908
Observations	143	143	143	143

Source: Computed from Secondary Data

The results of table 2 indicate that there was weak correlation between IIP with Indian stock market in terms of Sensex and Nifty, similarly WPI also had weak positive correlation with Indian stock market. These calculated correlation co-efficient were not statistically significant. Hence as per correlation analysis IIP and WPI did not have significant relationship with Indian stock market during the study period.

Table 3 gives the results of ADF Unit root test for the macro economic factors IIP and WPI and Indian stock market indices namely Sensex and Nifty. For this purpose the following null hypothesis was framed.

H_0 : Sensex, Nifty, IIP and WPI are non-stationary.

Table 3: Unit Root Test for Sensex, Nifty, IIP and WPI

Variable	ADF Statistics	P-Value	Critical Value	Hypothesis
Sensex	-1.57	0.49	1% -3.4319 5% -2.8621 10% -2.5671	Accepted
Nifty	-1.46	0.55		Accepted
IIP	-1.21	0.67		Accepted
WPI	-1.09	0.72		Accepted

Source: Computed from Secondary Data

It was noted from table 3 that the calculated values of ADF test statistics of both the macro economic factors IIP and WPI and market indices Sensex and Nifty were -1.57, -1.46 and the calculated values of ADF statistics of IIP and WPI were -1.21 and -1.09 respectively, they were less than the critical value at 1% level, hence the null hypothesis was accepted in all the cases and therefore the selected indices and macro economic factors (IIP and WPI) were non-stationary and they are unpredictable. In other words the selected indices had unit root during the study period.

Table4 brings out the results of Johansen Co-integration test between IIP and Indian stock market in terms of the indices of Sensex and Nifty. In this analysis trace test and maximum eigen value test were applied to know long-run dynamics between the variables.

Table 4: Co-integration Test between IIP and Indian Stock Market

Unrestricted Co-integration Rank Test (Trace) at 5%				
Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	Critical Value	Prob.**
Sensex				
None	0.0465	6.8435	15.4947	0.5959
At most 1	0.0027	0.3687	3.8415	0.5437
Nifty				
None	0.0425	6.2106	15.4947	0.6706
At most 1	0.0023	0.3093	3.8415	0.5781
Unrestricted Co-integration Rank Test (Maximum Eigen Value) at 5%				
Hypothesized No. of CE(s)	Eigen Value	Max. Eigen Value	Critical Value	Prob.**
Sensex				
None	0.0465	6.4748	14.2646	0.5531
At most 1	0.0027	0.3687	3.8415	0.5437
Nifty				
None	0.0425	5.9014	14.2646	0.6259
At most 1	0.0023	0.3093	3.8415	0.5781

Source: Computed from Secondary Data

Table 4 shows the results of the Johansen co-integration test. It indicated that the calculated values of both trace statistics (6.8435) and maximum eigen value (6.4748) were less than the critical value (15.4947 and 14.2646 respectively) between IIP and Sensex of BSE, hence they were not significant, So the null hypothesis was accepted and therefore IIP and Sensex were not co-integrated. Similarly the values of trace statistics and maximum eigen value of IIP and Nifty of NSE were 6.2106 and 5.9014 respectively, they were less than the critical value at 5% level, hence they were insignificant and the null hypothesis was accepted, therefore IIP and Nifty were not moving together. It is found that IIP and Indian stock market in terms of Sensex and Nifty were not co-integrated during the study period.

Table 5 gives the results of Johansen Co-integration test between WPI and Indian stock market in terms of the indices of Sensex and Nifty.

Table 5: Co-integration Test between WPI and Indian Stock Market

Unrestricted Co-integration Rank Test (Trace) at 5%				
Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	Critical Value	Prob.**
Sensex				
None	0.0750	11.6537	15.4947	0.1743
At most 1	0.0077	1.0550	3.8415	0.3044
Nifty				
None	0.0683	10.7112	15.4947	0.2299
At most 1	0.0079	1.0843	3.8415	0.2977
Unrestricted Co-integration Rank Test (Maximum Eigen Value) at 5%				
Hypothesized No. of CE(s)	Eigen Value	Max. Eigen Value	Critical Value	Prob.**
Sensex				
None	0.0750	10.5987	14.2646	0.1755
At most 1	0.0077	1.0550	3.8415	0.3044
Nifty				
None	0.0683	9.6269	14.2646	0.2376
At most 1	0.0079	1.0843	3.8415	0.2977

Source: Computed from Secondary Data

Table 5 reveals that the calculated values of both trace statistics (11.6537) and maximum eigen value (10.5987) were less than the critical value (15.4947 and 14.2646 respectively) between WPI and Sensex of BSE, hence they were not significant, So the null hypothesis was accepted and therefore WPI and Sensex were not co-integrated during the study period. Similarly the values of trace statistics and maximum eigen value of WPI and Nifty of NSE were 10.7112 and 9.6269 respectively, they were also less than the critical value at 5% level, hence they were not significant and the null hypothesis was accepted, therefore WPI and Nifty were not moving together. It was found that WPI and Indian stock market in terms of Sensex and Nifty were not co-integrated during the study period. Both the selected macro economic factors, IIP and WPI did not have co-integration relationship with Indian stock market in terms both the indices Sensex of BSE and Nifty of NSE..

The regression analysis tests the impact of an independent variable on dependent variable. There a particular variable has been assumed as dependent and another one or few as dependent. But in stock market it cannot be said that variable X influences variable Y, variable Y may influence variable X. So, the researcher has applied Granger causality test. It tests which variable causes another one. For this purpose null hypotheses are framed and the results between IIP and Indian stock market are presented in table 6.

Table 6: Granger Causality Test between IIP, WPI and Indian Stock Market

Null Hypothesis	Observations	F-Statistic	Prob	Ho
IIP and Sensex				
IIP does not Granger Cause SENSEX	140	1.8169	0.1799	Accepted
SENSEX does not Granger Cause IIP		2.7241	0.1011	Accepted
IIP and Nifty				
IIP does not Granger Cause NIFTY	140	1.8383	0.1774	Accepted
NIFTY does not Granger Cause IIP		2.8525	0.0935	Accepted
WPI and Sensex				
WPI does not Granger Cause SENSEX	140	3.5672	0.0610	Accepted
SENSEX does not Granger Cause WPI		0.4812	0.4891	Accepted
WPI and Nifty				
WPI does not Granger Cause NIFTY	140	3.8326	0.0523	Accepted
NIFTY does not Granger Cause WPI		0.4582	0.4996	Accepted

Source: Computed from Secondary Data

Table 6 shows that the macro economic factor IIP did not have Granger cause on both Sensex of BSE and Nifty of NSE, since the calculated values of F-statistics (1.8169 and 1.8383) were not significant. Similarly Sensex and Nifty did not have granger cause on IIP, since its calculated F-statistics were also not statistically significant (2.7241 and 2.8525 respectively). On the other hand, the calculated values of F-statistics of WPI and Sensex was 3.5672 and WPI and Nifty was 3.8326, they were not statistically significant, hence the null hypotheses were accepted and therefore WPI did not have granger cause on Indian stock market both in terms of return on Sensex and Nifty. The calculated value of F-statistics of Sensex on WPI was 0.4812, it was not significant at 5% level, hence the null hypothesis was accepted and there was no granger cause by Sensex on WPI. Identically the calculated value of F-statistics of Nifty on WPI was 0.4582, it was also not statistically significant, hence the null hypothesis was accepted in this case also and therefore there was no granger cause by Nifty on WPI during the study period.

CONCLUSION

The study attempted to know the relationship and impact of two macro economic variables namely IIP and WPI on the movements of Indian stock market in terms of the indices Sensex of BSE and Nifty of NSE during the period of 12 years from April 2005 to March 2017. The study evidenced that there was no significant relationship between IIP, WPI with Indian stock market both in terms of Sensex and Nifty as shown by the results of Correlation analysis. The study found unit root on all the selected factors (IIP, WPI, Sensex and Nifty) during the study period, in other words these factors were non-stationary during the period of study. As per the results of Johansen co-integration test, no co-integration relationship was found between IIP, WPI and Indian stock market. Similarly, both the selected macro economic factors, IIP and WPI did not have granger cause on the movements of Indian stock market (Sensex and Nifty) and the movement of Indian stock market also did not have granger cause on these macro economic factors during the period of study.

REFERENCES

1. Dharmendra Singh (2010), Casual Relationship between Macro-Economic Variables and Stock Market: A Case Study for India, Pakistan Journal of Social Science, Vol.30, No.2, pp.263-274.
2. Ashish Kumar (2011), An Empirical Analysis of Causal Relationship between Stock Market and Macroeconomic Variables in India, International Journal of Computer Science & Management Studies, Vol. 11, No.1, pp.8-14.

3. MohdYahyaMohdHussin et al (2012), Macroeconomic Variables and Malaysian Islamic Stock Market: A Time Series Analysis, Journal of Business Studies Quarterly, Vol.3, No.4, pp. 1-13.
4. Samveg Patel (2012), The Effect of Macroeconomic Determinants on the Performance of the Indian Stock Market, NMIMS Management Review, Vol.XXII, pp.117-127.
5. BhanuSireesha (2013), Effect of Select Macroeconomic Variables on Stock Returns in India, International Journal of Marketing, Financial Services and Management Research, Vol.2, No.6, pp.197-209.
6. Poojasingh (2014), Indian Stock Market and Macroeconomic Factors in Current Scenario, International Journal of Research in Business Management, Vol.2, No.11, pp.43-54.
7. www.bseindia.com
8. www.nseindia.com
9. <http://data.worldbank.org>
10. <https://dbie.rbi.org.in>