
The effect of Money Supply and Inflation rate on the Performance of National Stock Exchange

Mr. Ch.Sanjeev

Research Scholar, Telangana University

Dr. K.Aparna

Assistant Professor, Telangana University

Abstract:

The growth of the Indian economy depends on the performance of Indian stock market. In turn, the Indian stock market depends up on the performance of that country's macroeconomic variables like, Gross Domestic Production (GDP), Balance of Payment (BoP), Exchange rate, Inflation rate, Money Supply, Index of Industrial Production (IIP). The Indian stock market influenced by several factors like, Global events, information of respective company and macroeconomic variables. When the market is bearish, the investors are in a formidable situation about their investment, because of fall of the stock market. The falling of these markets is influenced by the macroeconomic variables. An attempt is made to study the effect of Money Supply (MS) and Inflation rate on performance of National Stock Exchange. From the study it is found that there is no long run relationship between inflation rate and CNX Nifty whereas, money supply and CNX Nifty are associated in the long run. Granger causality test found that inflation rate and money supply granger caused on CNX Nifty and both are unidirectional.

Keywords: *CNX Nifty, Money Supply (MS), Inflation rate and Long run association.*

Introduction:

The growth of the Indian economy depends on the performance of Indian stock market. In turn, the Indian stock market depends up on the performance of those country macroeconomic variables like, Gross Domestic Production (GDP), Balance of Payment (BoP), Exchange rate, Inflation rate, Money Supply, Index of Industrial Production (IIP). The stock market comprises Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). The benchmarks of these stock exchanges are Sensex and Nifty respectively. The Indian stock markets can be affected by several factors like, Global events, information of respective company and macroeconomic variables. When the market is bearish, the investors are in a formidable situation about their investment, because of fall of the stock market. The falling of these markets is influenced by the macroeconomic variables.

Literature Review:

Chandra Mohan .N and Chitradevi.N (2014) discussed the impact of inflation and exchange rate on stock market return in India for the period of 2003 to 2013. They found that the inflation is negatively influencing the price return on NSE CNX Nifty, the exchange rate positively affecting the price return on NSE CNX Nifty.

Michael adusei (2014) contributed empirical conversation using data 1992 January to December 2010 from Ghana Stock Exchange. Found that there is a negative statistically relationship between inflation and returns in the short run and positive statistically significant relationship in the long run

Saurabh singh ,Thripathi and kirthi (2012) examined the level of influence of exchange rate of inflation on BSE S&P Sensex. For establishing the relationship regression analysis has been used. The results suggested that inflation rate and exchange rate significantly affect the performance of BSE S&P Sensex.

Shahbaz Akmal MD (2007) established the relationship between stock market prices and inflation over the period of 1971-2006. They used the techniques ARDL; co-integration technique to detect the long run and short run affects between involves variables by error correction approach. Results supported that hypothesis that stocks hedges against inflation in long run but not in short run, while black economy promotes the stock market prices to heave as well as in short run.

Objectives of the Study

- To study the long run relationship between inflation rate, exchange rate and CNX Nifty movement.
- To analyse the causal relationship between among three variables

Hypothesis of the study

H₀₁ There is no long run relationship between selected economic variables and CNX Nifty

H₀₂ There is no causal relationship between selected economic variables and CNX Nifty.

Empirical Study:

Inflation (WPI)

Money Supply (M3)

NSE (CNX Nifty)

Augmented Dickey Fuller Test

Johenson Co-integration test

Ganger Causality test

Period of the Study:

The period of the study covers from 1st April 2007 to March 31st 2017.

Tools Used for analysis:

ADF unit root test:

The time series variables considered in this study are inflation, Money Supply and CNX Nifty index. Therefore, in the first step, unit root test is performed to find the data is stationary or not. To find the stationary of the data Augmented Dickey Fuller (ADF) test has been used. ADF regression equations are:

$$\Delta Y_t = \alpha_1 Y_{t-1} + \sum_{j=1}^p \gamma_j \Delta Y_{t-j} + \varepsilon_t \dots\dots\dots$$

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{j=1}^p \gamma_j \Delta Y_{t-j} + \varepsilon_t \dots\dots\dots$$

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 t + \sum_{j=1}^p \gamma_j \Delta Y_{t-j} + \varepsilon_t$$

Where ε_t is white noise the additional lagged terms are included to ensure that the errors are uncorrelated.

Granger causality Test: Granger causality is a technique for determining one time series is useful in forecasting another. Ordinarily, regressions reflect “mere” correlations..

$$y_t = \beta_{1,0} + \sum_{i=1}^p \beta_{1,i} y_{t-i} + \sum_{j=1}^p \beta_{1,p+j} x_{t-i} + e_{1t} \quad (1)$$

$$x_t = \beta_{2,0} + \sum_{i=1}^p \beta_{2,i} y_{t-i} + \sum_{j=1}^p \beta_{2,p+j} x_{t-i} + e_{2t} \quad (2)$$

Johnson Co integration test: This test has been applied to know the co integration between selected economic variable and CNX Nifty.

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^p \ln(1 - \hat{\lambda}_i)$$

$$\lambda_{max}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1})$$

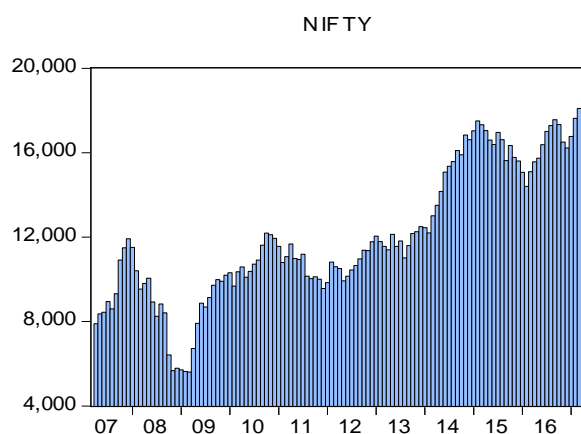
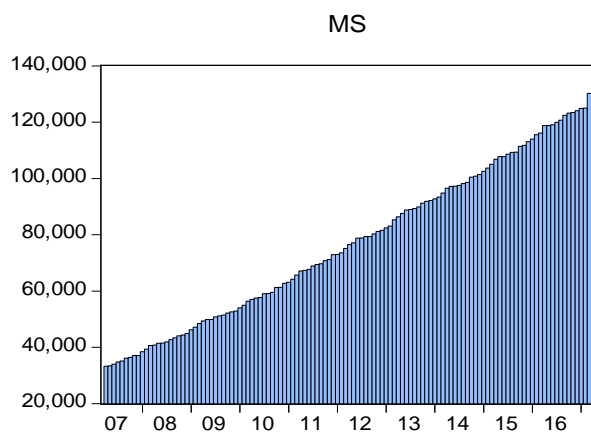
λ_{trace} tests the null that the number of cointegrating vectors is less than or equal to r against an unspecified alternative.

$\forall \lambda_{trace} = 0$ when all the $\lambda_i = 0$, so it is a joint test.

λ_{max} tests the null that the number of cointegrating vectors is r against an alternative of $r+1$.

Data Analysis and Interpretation:

Table No.1 Descriptive statistics Money Supply (MS) and CNX Nifty

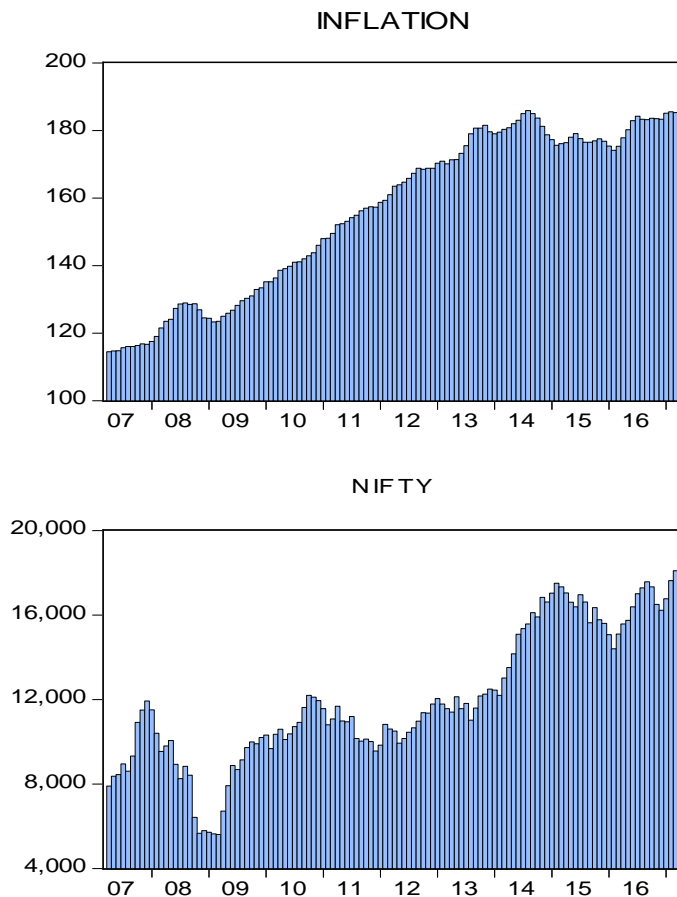


	MS	NIFTY
Mean	76797.19	11994.22
Median	75820	11388.5
Maximum	130222	18094
Minimum	33304	5605
Std. Dev.	27854.63	3199.846
Skewness	0.14408	0.225853
Kurtosis	1.809311	2.231799
Jarque-Bera Probability	7.503877	3.970853
	0.023472	0.137322
Sum	9215663	1439306
Sum Sq. Dev.	9.23E+10	1.22E+09
Observations	120	120

The table shows descriptive statistics of the individual variables Money supply and NIFTY Index. It is used to understand the characteristics of the variable and its fitness for further analysis of study. The chart portrays the pattern of monthly Money supply and Nifty index during the study period. Both Money supply and Nifty have found a positive mean returns during the study period. While both money supply and Nifty reports positive

skewness with 0.14408 and 0.225853 respectively. Money supply has a leptokurtic (kurtosis < 2.23) distribution of returns while Nifty shows an (Kurtosis > 1.80).

Table No.2 Descriptive statistics Inflation and CNX Nifty



	INFLATION	NIFTY
Mean	155.92	11994.22
Median	162.25	11388.5
Maximum	185.9	18094
Minimum	114.5	5605
Std. Dev.	24.02978	3199.846
Skewness	-0.351118	0.225853
Kurtosis	1.591488	2.231799
Jarque-Bera	12.3852	3.970853
Probability	0.002044	0.137322
Sum	18710.4	1439306
Sum Sq. Dev.	68714.21	1.22E+09
Observations	120	120

The table shows descriptive statistics of the individual variables Inflation and NIFTY Index. It is used to understand the characteristics of the variable and its fitness for further analysis of the study. The chart portrays the pattern of monthly Inflation and Nifty index during the study period. Both Inflation and Nifty have found a positive mean returns during the study period. While money supply reports negative skewness with -0.351118 but Nifty result records is positive skewness with 0.225853. Inflation has a leptokurtic (kurtosis < 2.23) distribution of returns while Nifty shows an (Kurtosis > 1.59).

Table No. 3 ADF for stationary of variables

VARIBLES	WITHOUT TREND		WITH TREND	
	Levels	1st Difference	Levels	1st Difference
NIFTY	0.8977	0.0000**	0.3096	0.0000**
INF	0.5841	0.0000**	0.8854	0.0000**
MS	1.0000	0.0000**	0.9868	0.0000**

In order to test the stationary of the data for each time series applied for unit root test. Augmented Dickey Fuller (ADF) test applied for the time series of the data and their first differences are estimated and presented in Table 3. Both models with and without trend are tested. The result shows in the above table that all the variables series are non-stationary at their first difference. The critical value significance at 5% level under ADF test.

Table No.4
Co-Integration between CNX Nifty and Inflation

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.052674	9.106581	15.49471	0.3556
At most 1	0.024764	2.883748	3.841466	0.0895
1 Cointegrating Equation(s):		Log likelihood	-	1043.821
Normalized cointegrating coefficients (standard error in parentheses)				
NIFTY	INF			
1.0000	-104.2173			
	(-31.94)			

Source: Data Compiled

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

*denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

It has been found from the Johenson co-integration test Nifty and Inflation rate do not have long run relationship at five percent significance level. Hence, there is no co-integration between Nifty and Inflation.

Table No. 5

Co-Integration between Nifty and Money Supply

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.091236	20.0951	15.49471	0.0094
At most 1 *	0.076024	9.093012	3.841466	0.0026
1 Cointegrating Equation(s):		Log likelihood	-1790.027	
Normalized cointegrating coefficients (standard error in parentheses)				
NIFTY	MS			
1.0000	-0.280159			
	(-0.05726)			

Source: Data Compiled

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

*denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

It has been found from the Johnson co-integration test that Nifty and Money Supply have long run relationship at five percent significance level. If Nifty index is increase by one time GDP will changes by 0.031157 times. Therefore there is a positive relationship between Nifty and Money Supply.

Table.No.6

Pair wise Granger Causality test between Nifty and Inflation

Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
INF does not Granger Cause NIFTY	118	1.84812	0.1623
NIFTY does not Granger Cause INF		0.28714	0.751

The granger causality test has been conducted to identify the causation. It has been found that there is unidirectional causation and inflation granger cause the Nifty. Therefore, present value of Nifty granger caused by lag two of inflation.

Table No.7

Pair wise Granger Causality test between Nifty and Money Supply

Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
MS does not Granger Cause NIFTY	118	4.28175	0.0161
NIFTY does not Granger Cause MS		0.05457	0.9469

The granger causality test has been conducted to identify the causation. It has been found that there is unidirectional causation and money supply granger cause the Nifty. Therefore, present value of Nifty granger caused by lag two of Money supply.

Findings of the study

The study analysed dynamic linkage between the inflation rate, money supply and CNX Nifty. The first step is tested ADF Unit root to test stationary of all the variables found that they are in non- stationary at their levels. But, become stationary in first difference.

Johnson co-integration test is applied to test long run relationship between inflation, money supply and CNX Nifty found that;

- 1) Co-integration test found that Inflation do not have the long run relationship with CNX Nifty. There is no co-integration the inflation and CNX Nifty.

- 2) At the same time, co-integration test found that money supply have long run relationship with the CNX Nifty.

Next step is Pair wise granger causality test has been applied to find the causal relationship between selected economic variables and CNX Nifty found that;

- i. There is unidirectional causation and inflation granger caused the CNX Nifty.
- ii. And money supply also granger caused the CNX Nifty.

Conclusion:

The study concludes titled “the effect of inflation, money supply on performance of National stock Exchange”. The study has been done to find the long run relationship between inflation rate, money supply and CNX Nifty, found that there is no long run relationship between inflation rate and CNX Nifty whereas, money supply and CNX Nifty is long run association. As per granger causality test used to find causality between inflation rate, money supply and CNX Nifty, found that inflation rate and money supply granger caused CNX Nifty and both are unidirectional.

Further Research: This study covered only two economic parameters and further study can be extend by considering the other macroeconomic parameters like GDP, balance of payments etc. In this study only focused objectives are long run association and causality among the variables so, further can be extend study on returns, volatility among the variables..

References

1. https://www.nseindia.com/products/content/equities/indices/historical_index_data.htm
<https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>
2. Chandra Mohan and chitradevi (2014), “Impact of inflation and exchange rate on stock market performance in India”, *Management*, vol.4 issue.3 pp 230-232. [https://www.worldwidejournals.com/indian-journal-of-applied-research-\(IJAR\)/file.php?val=March_2014_1492758432__70.pdf](https://www.worldwidejournals.com/indian-journal-of-applied-research-(IJAR)/file.php?val=March_2014_1492758432__70.pdf)
3. Michael Adusei (2014), “the inflation stock market returns nexus: evidence from the Ghana Stock Exchange”, *Journal of Economics and International finance*. <http://www.academicjournals.org/journal/JEIF/article-abstract/4DAA34C43712>
4. Narayana rao kvss and L M Bhole (1990) “Inflation and equity returns”, *Economic and Political Weekly*, vol.25 No.21 pp. M91-M96. <http://www.jstor.org/stable/4396320>
5. Richard and Donald (1981), “The effect of inflation on stock prices: international evidence”. *The Journal of finance*, Wiley for the American Finance Association, vol.36 No.2 pp. 277-289. <http://www.jstor.org/stable/2327009>
6. Saurabh, thripathi and kirthi (2012) “an empirical study of impact of exchange rate and inflation rate on performance bse S&P Sensex”, *A journal of Multidisciplinary Research*, vol.1 issue.3 June pp.20-31. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2255910
7. Shahbaz Akmal MD (2007), “Stock returns and inflation: An ARDL Econometric Investigation Utilizing Pakistani data”, *Pakistan Social and Economic Review*, Department of Economics, vol.45 No.1 pp.89-105. https://www.jstor.org/stable/25825305?seq=1#page_scan_tab_contents
8. Susan M wachter (1983), “The impact of real factors and inflation on the performance of the U.S stock market from 1960 to 1980: Discussion”, the journal of finance, *Wiley for the American Finance Association*, vol.38 No.2 pp 567-569. <http://www.jstor.org/stable/2327993>