International Journal Of Business Management
Available at www.ijbm.co.in
ISSN NO. 2349-3402
VOL. 2(2),2015

Relationship between Selected Macroeconomic Indicators and Stock Market: Evidence from India

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Abstract

The objective of this paper is to empirically investigate the impact of selected macroeconomic indicators on Indian stock market. The relationship between macroeconomic indicators and stock market though weaves a complex pattern, but it still gives meaningful insights for the researchers, academicians, government, investors and forecasters. For the purpose of conducting this study, Indian stock market has been represented by CNX NIFTY and selected macroeconomic indicators includes non-oil exports, oil imports, index of industrial production, exchange rate, international oil price, narrow money, yield on government securities & gold price. The frequency of the secondary data taken into consideration is monthly in nature. The time period of the study ranges from 1997 to 2014. The empirical findings of this study based on the long-run and short-run equilibrium econometric testing suggest that selected macroeconomic indicators do influence the Indian stock market.

Keywords: Macroeconomic indicators, stock market, cointegration, unit root

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1. Introduction

Stock market plays an indispensable role in the development and growth of an economy (Atje, Jovanovic 1993; Harris 1997). The liquidity provided by the stock market acts as a channel for ransferring funds from surplus to deficit sector. It also acts as an investment platform for corporate and government sector to raise funds in domestic and international markets. Besides this, efficient stock market helps in diversifying the idiosyncratic risk. Considering the importance of stock market, the major area of concern is that stock prices do respond to the external factors such as macroeconomic indicators; and since stock market operates in a macro economy, the influence of macroeconomic environment on the stock market cannot be ignored. For instance, severe stock market crash in the United States prior to the onset of Great Depression in 1929 and 1987, stock market crash of 2008 due to the failure of big financial institutions in the United Stated affected the world financial markets. The severity of these crashes weaves complex pattern which has always instigated researchers to find out the true state of macroeconomic factors affecting the stock market.

Establishment of relationship between macroeconomics variables and stock market have been a subject of interest and debate among economists in the developed nation over a past few decades. Furthermore, as emerging economies are getting integrated with the world economy and moreover, the relationship between macroeconomic variables and stock market is clear in the developed nation but not in emerging nations, therefore, the interest of researchers are shifting towards emerging nations in recent past. Therefore, the objective of this study is to investigate the impact of selected macroeconomic indicators on Indian stock market.

2. Literature Review

Empirical evidences of the interactions between macroeconomic variables and stock market with reference to developed economies can be seen in numerous studies. Most of the early studies in US of Bodie (1976), Fama and Schwert (1977), Jaffe and Mandelker (1977), Lintner (1973), Nelson (1976) and Oudet (1973) examine financial assets as a hedge against inflation and argued a negative relation between stock returns and changes in general price level.

Fama (1981), Geske and Roll (1983), Lee (1992) provide evidence of significant influences of macroeconomic variables on the stock market. Chen et al. (1986) examine whether macroeconomic variables explain unexpected changes in equity return on the basis of Fama's investigation. Chang and Pinegar (1989) find that seasonal stock market peaks coincide with industrial production peaks in the month of February and August. This paper documented that the economic variables such as industrial production, changes in the risk premium & yield curve were significant factors in explaining stock returns.

Jensen and Johnson (1993) conducted an event study to gauge the reaction of stock prices due to the announcement of Fed discount rate changes. In this study, pre and post stock returns including dividends are examined for the period of 29 years ranging from 1962 to 1990 taking into consideration 75 discount rate changes. The results of this study concluded that increases in the discount rate impacts stock prices negatively while decreases in the former effects latter positively.

Naka et al. (1998) examined the interrelationship between Indian stock market and macroeconomic variables for the period ranging from 1960 to 1995 by using VECM according to co-integration. They concluded that the five examined variables are co-integrated, and that three long-term equilibrium relationship exist between the variables. Adrangi, Chatrath and Shank (1999) explored that whether there exists a negative relationship between inflation rate and stock returns for the developing market of Peru and Chile as compared to developed economies on the basis of the 'proxy effect' given by Fama (1981) which states that inflation negatively effects the real economic activity which in turn impacts stock returns. The results of

International Journal Of Business Management
Available at www.ijbm.co.in
ISSN NO. 2349-3402
VOL. 2(2),2015

the study concluded that there exists a long-term cointegrating relationship between price levels, stock prices and real activity in line with the proxy effect taken into consideration.

Muradoglu, Taskin and Bigan (2000) tested the causal relationship between stock returns and macroeconomic variables such as inflation, interest rates, foreign exchange rates and industrial production of nineteen emerging markets for the period of twenty years from 1976 to 1997. The results of the study show that there is a two way relationship between stock returns and macroeconomic variables and the same depends upon financial liberalization of stock markets and increase in its size.

Bailey (2001) studied the impact of anticipated and unanticipated fiscal & monetary policy on the Jamaican equity market under the VAR framework. The empirical results of the study show that unanticipated & anticipated fiscal policy both caused contractionary effect on the stock market; whereas unanticipated monetary policy causes short-run positive impact on the stock market the anticipated monetary policy positively affects the stock market after three months only. Sharma and Mahendru (2010), Pal and Mittal (2011), Srinivasan (2011) are some of the studies which found significant linkages between macroeconomic variables and Indian stock market.

3. Data Issues

For the purpose of analysing the impact of selected macroeconomic indicators on Indian stock market, the variables are represented as follows: i) selected macroeconomic indicators have been based on the literature namely, NOEXP (Non-Oil Export), OIMP (Oil Import), IIPGI (Index of Industrial Production-General Index), EXUSD (Exchange rate of the Indian rupees per US dollar), INTOIL (International oil price), M1 (Narrow money), 10GSY (10-year government securities yield) & GPIIM (Standard Gold Price in International Market (London)) and ii) Indian stock market has been represented by stock market index CNX NIFTY (Nifty) listed on national stock exchange (NSE) of India. Stock market has been chosen as a dependent variable of this objective whereas selected macroeconomic indicators are considered an independent variable. The frequency of the secondary data taken into consideration is monthly in nature. The time period of the study ranges from 1997 to 2014. The sources of data includes RBI database and Bloomberg for economy related data while stock market related data has been collected from CMIE Prowess. All the series taken into consideration for analysing the model undergoes log-transformation and seasonal adjustment using moving average method.

4. Econometric Framework

The methodology of this study has been based on the time series procedure as the dataset taken into consideration is time series in nature. To meet the assumption of stationarity in time series procedure, the dataset undergoes unit-root test and for the purpose of the same, augmented Dickey-Fuller test and Phillips-Perron test has been employed. And on the basis of which it was found that all the variables taken into consideration in this objective are stationary at I (1). After testing for stationarity, the principal method employed for testing the long-run and short-run dynamics of relationship between stock market & macroeconomic variables, the study has made use of Johansen multivariate cointegration and vector error correction mechanism (VECM) respectively. To further investigate the forecasting component in the short-run, the study has estimated the impulse response functions (IRFs) and variance decompositions (VDCs) under the VECM framework. The detailed econometric framework has been discussed in the following sections.

4.1 Unit Root Testing

The nature of economic series is usually non-stationary, but one of the most important assumptions for the purpose of applying time series econometric procedures is that data series should be stationary. Non-stationary data series causes inconstancy in the mean and variance of the economic variables because of which we cannot generalize to other periods. Furthermore, Ordinary Least Square (OLS) estimates produce spurious regression results in the presence of non-stationary data series. Therefore, it becomes important to test for the stationarity. The unit root methodology by taking into account the first-order autoregressive process (AR (1)) can be expressed through a simple equation (1) as follows:

$$X_t = \phi X_{t-1} + \varepsilon_t \quad (1)$$

where ε_t is white noise and ϕ is the parameter ranging between -1 < ϕ< 1. This process can be re-written in a form of first-order difference equation:

$$X_t - \phi X_{t-1} = \varepsilon_t \quad (2)$$

It can be further re-stated as:

$$(1 - \phi L)X_t = \varepsilon_t \quad (3)$$

For the equation (3) to be stationary requires -1 < ϕ< 1 as the root of the characteristic equation $1 - \phi L$ = 0 must be greater than unity in absolute terms. The hypotheses for testing the stationarity of X_t have been formulated as follows:

H_0: $|\phi| \geq 1$, non-stationarity; H_a: $|\phi|$ < 1, stationarity.

If $|\phi|$ = 1, i.e., it is a problem of non-stationarity. The unity of ϕ is referred to as Unit root problem. The above example is a case of random walk without drift i.e., without constant term and if the same is tested with a constant term or intercept, it becomes random walk with drift. In this study, we have considered both the types of model i.e., random walk with drift and random walk without drift. Furthermore, this study has tested unit root using augmented Dickey-Fuller test and Phillips-Perron test explained as follows:

Augmented Dickey-Fuller (1979) test is obtained by the following regression equation:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta Y_{t-1} + \varepsilon_t \quad (4)$$

where Δ is the difference operator, β, δ and α are the coefficients to be estimated, Y is the time series properties are examined and ε is the white-noise error term.

Phillips and Perron (1988) proposed a non parametric technique of controlling for higher order autocorrelation in a data series based on first order auto-regressive AR (1) process explained as follows:

$$\Delta Y_t = \alpha + \beta Y_{t-1} + \varepsilon_t \quad (5)$$

where Δ is the difference operator, α is the constant, β is the slope and Y_{t-1} is the first lag of the variable Y. The testing of unit root helps in determining whether series take into account is stationary or non-stationary on the basis of which level of integration is also defined.

International Journal Of Business Management
Available at www.ijbm.co.in
ISSN NO. 2349-3402
VOL. 2(2),2015

4.2 Multivariate Johansen Cointegration Test

The multivariate Johansen approach to cointegration is based on Johansen (1988); Johansen and Juselius (1990) methodology. This approach considers maximum likelihood method to form a vector autoregressive (VAR) of order p in which variables are integrated of same order can be given as:

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + A_3 Y_{t-3} + \dots + A_p Y_{t-p} + B_{X_t} + \varepsilon_t \qquad (6)$$

where Y_t denotes $n \times 1$ vector of variables integrated at same order, A_i indicates $K \times K$ matrices of parameters, X_t represents $K \times 1$ deterministic vector and ε_t signifies vector of error term.

The above VAR equation can be restated as follows:

$$\Delta Y_t = \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + \dots + \Gamma_{p-1} \Delta Y_{t-p+1} + \Pi Y_{t-p} + B_{X_t} + \varepsilon_t \qquad (7)$$

$$\Gamma_i = \sum_{i=1}^{p-1} A_i - I_k \qquad (8)$$

$$\Pi = \sum_{j=1}^{i} A_j - I_k \qquad (9)$$

The equation (7) represents the rank (r) of Π indicated by the number of cointegrating vector. While equation (8) represents the short-run dynamics of the $K \times K$ matrix and equation (9) captures the dynamics of the long-term equilibrium relationship among variables.

The Johansen approach to cointegration analysis employ two types of likelihood ratios test statistics to establish the cointegrating vector for the equation (7) namely, trace test and maximum eigenvalue test.

Trace test statistics can be represented through the following:

$$\lambda_{trace} = -T \sum_{i=r+1}^{n} \ln(1 - \lambda_i) \qquad (10)$$

where λ_i represents characteristic roots estimated from Π matrices, n denotes the number of characteristic root of Π, and T signifies number of observations taken into consideration. The trace test statistics estimates alternative hypothesis of p cointegrating vectors against the null hypothesis of at most r cointegrating vector.

Maximum eigen test statistics can be stated as follows:

$$\lambda_{max} = -T \ln(1 - \lambda_i) \tag{11}$$

The maximum eigen test statistics estimate the alternative hypothesis of $r + 1$ cointegrating vectors against the null hypothesis of r cointegrating vectors.

4.3 Vector Error Correction Mechanism

The VECM represents the short run dynamics of disequilibrium among the cointegrated variables captured by error correction term. This mechanism is restricted to the testing of long-run relationship while adjusting for the short run deviations.

The following equation explains the VECM:

$$\Delta Y_t = \alpha_1 + \beta_i\, ECT_{t-1} + \sum_{i=1}^{n} \delta_i\, \Delta Y_{t-i} + \sum_{i=1}^{n} \gamma_i\, \Delta X_{t-i} + \varepsilon_{1t} \tag{12}$$

$$\Delta X_t = \alpha_2 + \beta_i\, ECT_{t-1} + \sum_{i=1}^{n} \mu_i\, \Delta Y_{t-i} + \sum_{i=1}^{n} \lambda_i\, \Delta X_{t-i} + \varepsilon_{2t} \tag{13}$$

where ECT_{t-1} represents error correction term lagged for one period in this case.

4.4 Impulse Response Function

Impulse response function represents the response of a variable to one standard deviation innovation or shock to another variable by adjusting short run dynamics among the selected variables taken into consideration. Impulse response function is determined under the framework of restricted vector auto-regression which can be represented as follows:

$$Y_t = \mu + \epsilon_t + \psi_1\, \epsilon_{t-1} + \psi_2\, \epsilon_{t-2} + \psi_3\, \epsilon_{t-3} + \dots \tag{14}$$

where

$$\psi_s = \frac{\partial Y_{i,t+s}}{\partial e_t} \tag{15}$$

In the above equation, $Y_{i,t+s}$ describes one standard deviation innovation in Y_{jt} with other selected variables earlier held constant or either dated t.

4.5 Variance Decomposition

Variance decomposition is also referred as forecast error variance decomposition. It permits to forecast the fluctuations among the variables due to a random shock of one innovation to the selected group of variables in the short run. This study has chosen Cholesky decomposition for the purpose of the application of variance decomposition.

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Available at www.ijbm.co.in
ISSN NO. 2349-3402
VOL. 2(2),2015

The lag length of the above long-run and short-run tests has been based on Schwarz information criteria (SC) or Akaike information criteria (AIC). While the study has incorporated the results of other lag length criteria's for the purpose of comparison namely, Hannan-Quinn criterion (HQ), Final prediction error (FPE) and sequential modified likelihood ratio test statistic (LR).

5. Empirical Results

This session elaborates the empirical test results of this study as follows:

5.1 Unit Root Test Results

Table 1: Unit Root Test Results

	Augmented Dickey Fuller				*Phillip Perron*			
	Level		*First Difference*		*Level*		*First Difference*	
Variable	$t_{constant}$	$t_{constant+trend}$	$t_{constant}$	$t_{constant+trend}$	$t_{constant}$	$t_{constant+trend}$	$t_{constant}$	$t_{constant+trend}$
Stock Market								
NIFTY	-0.5898	-2.1695	-13.5099*	-13.4777*	-0.6655	-2.3910	-13.5385*	-13.5070*
Selected Macroeconomic Indicators								
NOEXP	-0.3580	-2.9864	-4.4407*	-4.4193*	-0.7815	-6.0036*	-35.1227*	-
OIMP	-0.8763	-4.1029*	-8.9335*	-	-0.7804	-4.2368*	-18.8684*	-
IIPGI	0.4387	-1.4555	-18.7290*	-18.7240*	0.2194	-2.3247	-28.9513*	-29.0792*
EXUSD	-0.5154	-1.4463	-11.7612*	-11.7436*	-0.4070	-1.2604	-11.6902*	-11.6785*
INTOIL	-1.0052	-3.2939	-12.0680*	-12.0430*	-1.0461	-3.1287	-12.0680*	-12.0430*

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Available at www.ijbm.co.in
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M1	-0.1950	-1.8476	-3.4050*	-3.37563	-0.6166	-2.4805	-17.8186*	-17.8057*
10GSY	-2.2365	-1.6886	-14.1118*	-14.2398*	-2.2341	-1.67022	-14.1104*	-14.2398*
GPIIM	1.2652	-1.7539	-14.1670*	-14.3941*	1.1514	-1.7630	-14.1834*	-14.3901*

Note: *, ** and *** denotes statistical significance at 1%, 5% and 10% respectively. H_0: unit root exists; H_a: unit root does not exist.

The table 1 shows the test result of unit root for the purpose of identification of stationarity and order of integration. The study has employed augmented Dickey-Fuller test and Phillips-Perron test with drift and without drift; both at level and first difference of the time series. The critical values for the significance level of augmented Dickey-Fuller test and Phillips-Perron test without trend at 1 per cent, 5 per cent and 10 percent are -3.46, -2.88 and -2.57 respectively. While the critical values for the significance level of both the unit root tests with trend at 1 per cent, 5 per cent and 10 percent are -3.99, -3.43 and -3.14 respectively. On the basis of the unit root test employed above, it can be concluded all the variables taken into consideration are stationary at I (1).

5.2 Lag Order Selection Criteria

Table 2: Lag Order Selection Criteria

Endogenous variables: LNIFTY LIIPGI LNOEXP LOIMP LEXUSD LINTOIL LM1 L10GSY LGPIIM
Exogenous variables: C
Sample: 1997M04 2014M02
Included observations: 195

Lag	LogL	LR	FPE	AIC	SC	HQ
0	1263.784	NA	2.08e-17	-12.86958	-12.71852	-12.80842
1	3199.998	3673.841	1.14e-25*	-31.89741	-30.38680*	-31.28578*
2	3281.006	146.2293	1.14e-25	-31.89749*	-29.02732	-30.73540
3	3349.207	116.8175	1.32e-25	-31.76623	-27.53651	-30.05367

4	3400.253	82.71960	1.83e-25	-31.45900	-25.86973	-29.19597
5	3452.497	79.83992	2.56e-25	-31.16407	-24.21524	-28.35057
6	3526.300	105.9735*	2.93e-25	-31.09026	-22.78187	-27.72629
7	3584.146	77.72149	4.05e-25	-30.85278	-21.18484	-26.93835
8	3656.825	90.94161	4.96e-25	-30.76743	-19.73994	-26.30253

Note: * indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level).

On the basis of the test results of the table 2, the NIFTY model has chosen appropriate lag length of 2 based on the AIC.

5.3 Multivariate Johansen Cointegration Test Results

Table 3: Cointegration Test Results Based on Trace statistics

Unrestricted Cointegration Rank Test (Trace)				
Variables: LNIFTY LIIPGI LNOEXP LOIMP LEXUSD LINTOIL LM1 L10GSY LGPIIM				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.336237	248.5379	197.3709	0.0000
At most 1 *	0.249454	166.5718	159.5297	0.0195
At most 2	0.165327	109.1810	125.6154	0.3210
At most 3	0.134415	73.03805	95.75366	0.6159
At most 4	0.086589	44.16817	69.81889	0.8562
At most 5	0.066436	26.05441	47.85613	0.8875
At most 6	0.030650	12.30522	29.79707	0.9207
At most 7	0.019614	6.079359	15.49471	0.6861
At most 8	0.010532	2.117645	3.841466	0.1456

Note: 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.

Table 4: Cointegration Test Results Based on Max Eigenvalue

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Variables: LNIFTY LIIPGI LNOEXP LOIMP LEXUSD LINTOIL LM1 L10GSY LGPIIM				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None*	0.336237	81.96610	58.43354	0.0001
At most 1*	0.249454	57.39076	52.36261	0.0141
At most 2	0.165327	36.14296	46.23142	0.3895
At most 3	0.134415	28.86988	40.07757	0.5004

At most 4	0.086589	18.11376	33.87687	0.8719
At most 5	0.066436	13.74919	27.58434	0.8395
At most 6	0.030650	6.225861	21.13162	0.9780
At most 7	0.019614	3.961714	14.26460	0.8633
At most 8	0.010532	2.117645	3.841466	0.1456

Note: Max-eigenvalue 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.

The test results of the tables 3 and 4 based on trace statistics and max eigenvalue indicates that there are two cointegrating equations (CointEq1 and CointEq2) at 5 per cent.

5.4 Vector Error Correction Model Estimates

Table 5: Vector Error Correction Estimates

Error Correction	Coefficient	Standard Error	t-statistics	Prob. value
CointEq1	0.005660	0.020456	0.276681	0.7821
CointEq2	-0.014053	0.271356	-0.051790	0.9587
D(LNIFTY(-1))	-0.043568	0.086003	-0.506591	0.6125
D(LNIFTY(-2))	0.056574	0.091667	0.617168	0.5372
D(LIIPGI(-1))	0.323106	0.343071	0.941804	0.3464
D(LIIPGI(-2))	0.587271	0.307479	1.909955	0.0563
D(LNOEXP(-1))	0.062824	0.085368	0.735921	0.4619
D(LNOEXP(-2))	-0.117333	0.077033	-1.523155	0.1279
D(LOIMP(-1))	0.027752	0.073994	0.375059	0.7077
D(LOIMP(-2))	-0.019837	0.062355	-0.318129	0.7504
D(LEXUSD(-1))	-0.738909	0.313731	-2.355234	0.0186**
D(LEXUSD(-2))	0.051569	0.317661	0.162340	0.8711
D(LINTOIL(-1))	-0.152271	0.099668	-1.527772	0.1268
D(LINTOIL(-2))	0.000473	0.093285	0.005066	0.9960
D(LM1(-1))	0.257577	0.281874	0.913801	0.3610
D(LM1(-2))	0.049140	0.269342	0.182444	0.8553
D(L10GSY(-1))	0.242913	0.130235	1.865194	0.0623
D(L10GSY(-2))	0.155663	0.127315	1.222655	0.2216
D(LGPIIM(-1))	0.017636	0.139035	0.126848	0.8991
D(LGPIIM(-2))	0.089025	0.138674	0.641971	0.5210
C	0.004130	0.007257	0.569113	0.5694

Model Specification:

D(LNIFTY) = C(1) * CointEq1 + C(2) * CointEq2 + C(3) * D(LNIFTY(-1)) + C(4) *

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Available at www.ijbm.co.in
ISSN NO. 2349-3402
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D(LNIFTY(-2)) + C(5) * D(LIIPGI(-1)) + C(6) * D(LIIPGI(-2)) + C(7) * D(LNOEXP(-1)) + C(8) * D(LNOEXP(-2)) + C(9) * D(LOIMP(-1)) + C(10) * D(LOIMP(-2)) + C(11) * D(LEXUSD(-1)) + C(12) * D(LEXUSD(-2)) + C(13) * D(LINTOIL(-1)) + C(14) * D(LINTOIL(-2)) + C(15) * D(LM1(-1)) + C(16) * D(LM1(-2)) + C(17) * D(L10GSY(-1)) + C(18) * D(L10GSY(-2)) + C(19) * D(LOGGPIIM(-1)) + C(20) * D(LOGGPIIM(-2)) + C(21)

where

CointEq1 = LNIFTY(-1) - 4.03001497337 * LNOEXP(-1) - 7.57416909029 * LOIMP(-1) - 1.64819872403 * LEXUSD(-1) + 6.85670948041 * LINTOIL(-1) + 6.60272877914 * LM1(-1) - 1.24736533137 * L10GSY(-1) + 1.88811826787 * LOGGPIIM(-1) - 3.67718011232

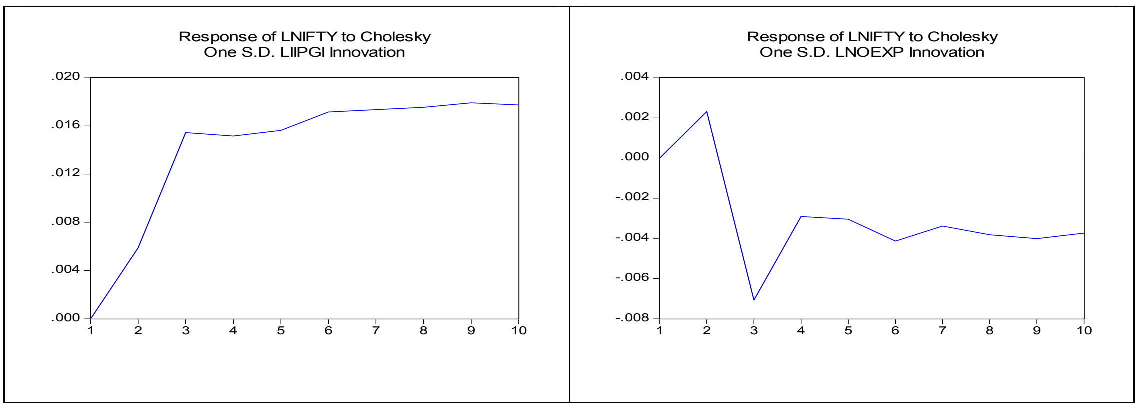
CointEq2 = LIIPGI(-1) + 0.456526186205 * LNOEXP(-1) + 0.400632619874 * LOIMP(-1) + 0.508338533357 * LEXUSD(-1) - 0.424762616423 * LINTOIL(-1) - 1.02454469949 * LM1(-1) + 0.0231814057484 * L10GSY(-1) - 0.185083318123 * LOGGPIIM(-1) - 2.32147383493

Note: * and ** denote statistical significance at 1% and 5% respectively; L, D as a prefix of variable symbols represents Log-transformation and Difference operators respectively.

The vector error correction mechanism under the VAR framework tests the short-run dynamics of the relationship between the variables taken into consideration. On the basis of the test results of the above table 5, it can be concluded that EXUSD influences the Indian stock returns negatively in the short-run.

5.5 Impulse Response Functions

Figure 1 depicts the impulse response shocks of NIFTY to one standard deviation innovation in IIPGI, NOEXP, OIMP, EXUSD, INTOIL, M1, 10GSY and GPIIM separately.



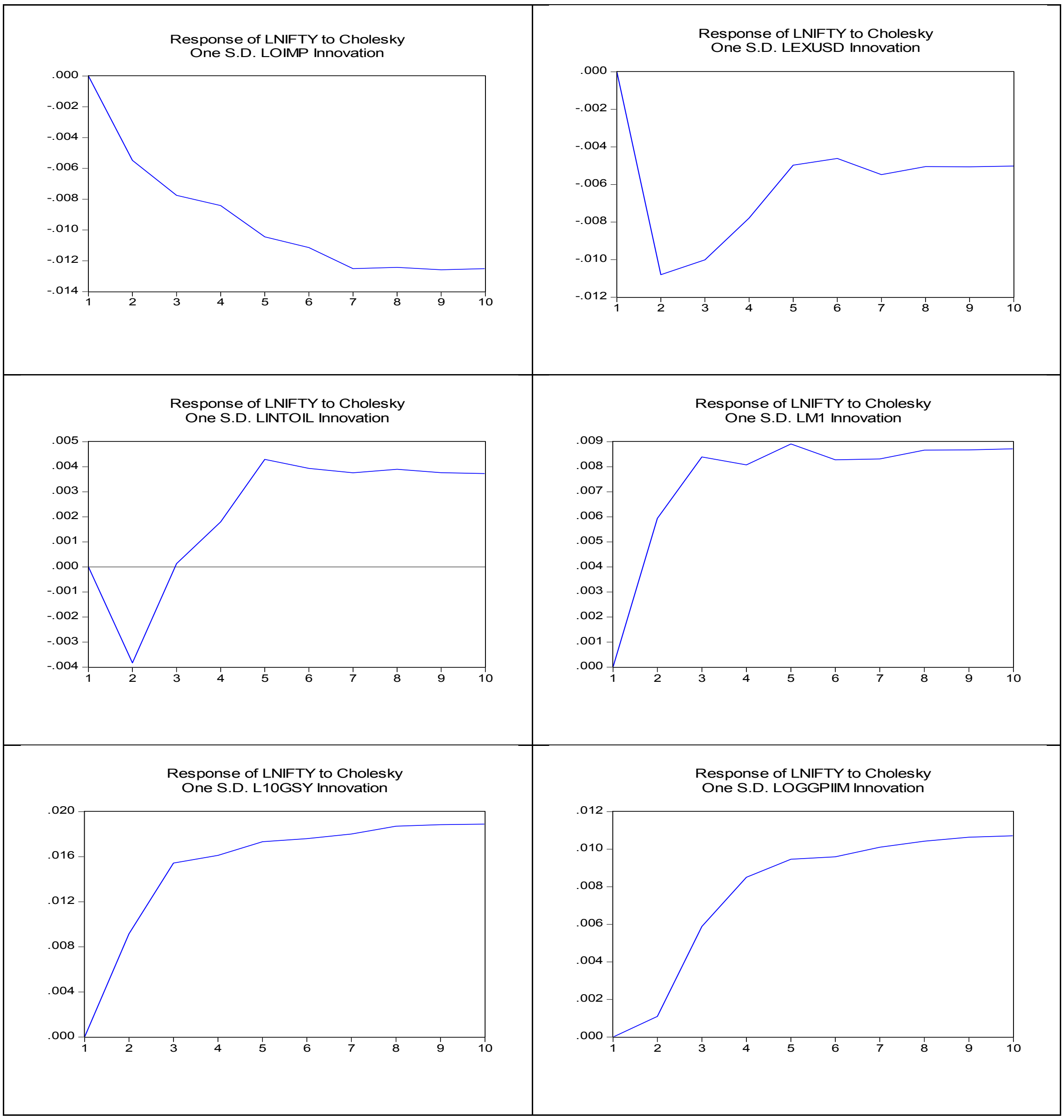


Figure 1 Impulse Response Functions

The impulse response functions of NIFTY exhibits that one standard deviation innovation in selected macroeconomic indicators affects the future short-run dynamics of stock market.

5.6 Variance Decomposition Test Results

The table 6 presents the test results of variance decomposition analysis of NIFTY with NIFTY, IIPGI, NOEXP, OIMP, EXUSD, INTOIL, M1, 10GSY and GPIIM over the future period of 10 months.

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Available at www.ijbm.co.in
ISSN NO. 2349-3402
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Table 6 Variance Decomposition Test Results

Period	LNIFTY	LIIPGI	LNOEXP	LOIMP	LEXUSD	LINTOIL	LM1	L10GSY	LGPIIM
1	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	97.06497	0.316226	0.048972	0.273789	1.064565	0.133842	0.321739	0.764847	0.011054
3	93.61039	1.567187	0.317844	0.516477	1.244124	0.084274	0.606083	1.848087	0.205536
4	92.20212	2.081775	0.264297	0.665583	1.148620	0.074164	0.707050	2.408602	0.447789
5	91.20345	2.382456	0.233220	0.860444	0.963523	0.115901	0.797791	2.812543	0.630667
6	90.49140	2.675142	0.231786	1.011894	0.831025	0.133120	0.818804	3.062211	0.744616
7	89.93889	2.867087	0.217224	1.175608	0.755098	0.140837	0.828535	3.239467	0.837255
8	89.47956	3.013059	0.212325	1.286983	0.692055	0.148168	0.845322	3.408253	0.914272
9	89.09854	3.141358	0.211003	1.375458	0.644819	0.151885	0.857660	3.540876	0.978405
10	88.81455	3.231259	0.206947	1.441319	0.607565	0.154391	0.868202	3.645537	1.030229

The test results of table 6 suggest that the short run variations in the NIFTY over a period of 10 months due to a innovation in IIPGI, NOEXP, OIMP, EXUSD, INTOIL, M1, 10GSY and GPIIM.

International Journal Of Business Management
Available at www.ijbm.co.in
ISSN NO. 2349-3402
VOL. 2(2),2015

6. Conclusion

This study investigates the impact of selected macroeconomic indicators on the Indian stock market. The empirical findings of this study based on the long-run and short-run equilibrium econometric testing suggest that selected macroeconomic indicators do influence Indian stock market i.e., the short-run and long-run variation in the stock prices can be explained through the changes in the cyclical patterns of macroeconomic indicators. Based on the test result of this study, it can be further concluded that investors can make abnormal returns on the basis of the cyclical trends of macroeconomic indicators as Indian stock market is still not semi-strong form efficient.

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