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Impact of Monetary Policy on Stock Market: Evidence from India

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ABSTRACT

The present study examine the influence of monetary policy variables (such as broad money), FII growth and intermediate target (inflation rate) on stock market performance as measured by growth rate of stock market capitalization for the period 1995 April and 2016 March in India. The study has been able to establish that the supply of money, the condition of credit and the price level influence the performance of the stock market over the short, medium and long run period. All countries had the same lag length of 5 because that was the lag at which the information criteria were at their minimum values. Analysis of the impulse response functions and decomposition of variance for Market growth has been done to show the effect of monetary policy variables and FII growth. The own shocks of the monetary policy constitute a significant source of variation in growth forecast error in the time horizon, ranging from 100% to 75%. Fifteen years after, variation in growth are accounted by broad money (82%) and FII (72) shock while that of market capitalization (15%) is relatively large in India over the sample period. The impulse response interpreted that money growth in addition to market growth is the major determinant of stock market performance since it is the major variable that determines stock market performance in the long run. This is followed by FII growth and inflation rate which were secondary determinant affecting the stock market of India. The short run, medium run and long run equilibrium relationships between the four variables has been examined and these would be useful in giving appropriate policy recommendations to central bankers for better formulation of monetary policy for stock market stability and growth.

Key Words : Monetory policy, Stock market, FII growth

INTRODUCTION

According to the Oxford Dictionary of Economics, monetary policy is the use by the government or central bank of interest rates or controls on the money supply to influence the economy. The Central Bank of every country is the agency which formulates and implements monetary policy on behalf of the government in an attempt to achieve a set of objectives that are expressed in terms of macroeconomic variables such as the achievement of a desired level or rate of growth in real activity, the exchange rate, the price level or inflation, the balance of payment, real output and employment. Monetary policy works through the effects of the cost and availability of loans on real activity, and through this on inflation, and on international capital movements and thus on the exchange rate. Its actions such as changes in the central bank discount rate have at best an indirect effect on

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macroeconomic variables and considerable lags are involved in the policy transmission mechanism. The monetary policy goals of the Reserve Bank of India (the Central Bank of the India), are often stated as "price stability" and "sustainable economic growth". Recently officials and academic economists have addressed the question of whether, in addition to price level stability, a central bank should also consider the stability of assets prices. Monetary policy makes use of various instruments which include interest rate, reserve requirements (cash requirements or cash ratio and liquidity ratio), selective credit controls, rediscount rate, Treasury bill rate amongst others.

Monetary policy of India:

Monetary policy is the process by which monetary authority of a country, generally a central bank controls the supply of money in the economy by exercising its control over interest rates in order to maintain price stability and achieve high economic growth. In India, the central monetary authority is the Reserve Bank of India (RBI) is so designed as to maintain the price stability in the economy.

Monetary operations involve monetary techniques which operate on monetary magnitudes such as money supply, interest rates and availability of credit aimed to maintain Price Stability, Stable exchange rate, Healthy Balance of Payment, Financial stability, Economic growth. RBI, the apex institute of India which monitors and regulates the monetary policy of the country stabilizes the price by controlling Inflation. RBI takes into account the following monetary policies:

Open market operations:

An open market operation is an instrument of monetary policy which involves buying or selling of government securities from or to the public and banks. This mechanism influences the reserve position of the banks, yield on government securities and cost of bank credit.

Cash reserve ratio:

Cash Reserve Ratio is a certain percentage of bank deposits which banks are required to keep with RBI in the form of reserves or balances .Higher the CRR with the RBI lower will be the liquidity in the system and vice-versa. RBI is empowered to vary CRR between 15 per cent and 3 per cent.

Statutory liquidity ratio:

Every financial institution has to maintain a certain quantity of liquid assets with themselves at any point of time of their total time and demand liabilities. These assets can be cash, precious metals, approved securities like bonds etc. The ratio of the liquid assets to time and demand liabilities is termed as the statutory liquidity ratio.

Bank rate policy:

The bank rate, also known as the discount rate, is the rate of interest charged by the RBI for providing funds or loans to the banking system. This banking system involves commercial and co-operative banks, Industrial Development Bank of India, IFC, EXIM Bank, and other approved financial institutes.

Credit ceiling:

In this operation RBI issues prior information or direction that loans to the commercial banks

will be given up to a certain limit. In this case commercial bank will be tight in advancing loans to the public.

Credit authorization scheme:

Credit Authorization Scheme was introduced in November, 1965 when P C Bhattacharya was the chairman of RBI. Under this instrument of credit regulation RBI as per the guideline authorizes the banks to advance loans to desired sectors.

Moral suasion:

Moral Suasion is just as a request by the RBI to the commercial banks to take so and so action and measures in so and so trend of the economy

Repo rate and reverse repo rate:

Repo rate is the rate at which RBI lends to commercial banks generally against government securities. Reduction in Repo rate helps the commercial banks to get money at a cheaper rate and increase in Repo rate discourages the commercial banks to get money as the rate increases and becomes expensive. Reverse Repo rate is the rate at which RBI borrows money from the commercial banks. The increase in the Repo rate will increase the cost of borrowing and lending of the banks which will discourage the public to borrow money and will encourage them to deposit.

Indian stock market:

A stock market or equity market is the aggregation of buyers and sellers (a loose network of economic transactions, not a physical facility or discrete entity) of stocks (shares); these are securities listed on a stock exchange as well as those only traded privately. Most of the trading in the Indian stock market takes place on its two stock exchanges: the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE). The BSE has been in existence since 1875. The NSE, on the other hand, was founded in 1992 and started trading in 1994. However, both exchanges follow the same trading mechanism, trading hours, settlement process, etc. At the last count, the BSE had about 4,700 listed firms, whereas the rival NSE had about 1,600. Out of all the listed firms on the BSE, only about 500 firms constitute more than 90% of its market capitalization; the rest of the crowd consists of highly illiquid shares.

The National Stock Exchange (NSE) is stock exchange located in Mumbai, India. National Stock Exchange (NSE) was established in the mid 1990s as a demutualised electronic exchange. NSE provides a modern, fully automated screen-based trading system, with over two lakh trading terminals, through which investors in every nook and corner of India can trade. NSE has played a critical role in reforming the Indian securities market and in bringing unparalleled transparency, efficiency and market integrity.

NSE has a market capitalisation of more than US$989 billion and 1,635 companies listed as on July 2013. Though a number of other exchanges exist, NSE and the Bombay Stock Exchange are the two most significant stock exchanges in India and between them are responsible for the vast majority of share transactions. NSE's flagship index, the CNX NIFTY 50, is used extensively by investors in India and around the world to take exposure to the Indian equities market

The proposed study contributes to the existing literature in many ways. This is the first study in the context of India that empirically investigates the relationship between monetary policy and stock market. The issues such as nexus between monetary policy and financial market stability etc. are unique investigations in the context of emerging market such as India. Unlike some developed

and developing central banks, India always maintained a better monetary policy tradition and scholars are of the opinion that this prudential policy insulated the economy from the shocks of global economic meltdown in 2008 (Mohan, 2012, Stiglitz, 2013). The country study therefore assumes significance with the given heterogeneity of Emerging Markets and unique structure of monetary policy. This study, therefore, provides some fresh insights into the working of financial markets and offers useful inputs for policy.

Literature review:

The extant literature suggests several important monetary policy transmission channels through which monetary policy decisions affect stock returns. The interest rate channel targets the cost of capital of firm and influences the present value of firm's future net cash flows. Credit channel on the other hand is an indirect channel that aims at adjusting the interest rates. Using credit channel, central bank influences the level of investment by altering premium on external finance of the firms. This channel affects the market value of firms so also the present value of its future cash flows. The monetary channel has second and later round effects on nominal income of money supply that follow from the initial change in interest rate. The exchange rate channel explains that the lowering of the interest rates leads to a depreciation of the domestic currency resulting in the competitiveness of exports. This trade competitiveness of the economy eventually leads to higher asset prices (Chatziantoniou *et al.*, 2013). The hike in interest rates adversely affects asset prices via wealth channel.

The pertinent literature document that the expected stock returns are higher during expansionary monetary policy periods whereas contractionary policy stringently affects investors' required returns (Jensen and Johnson, 1995). This view is consistent with the argument of Fama and French (1989) that the predictable variation in returns reflects rational variation in required returns. Thorbecke (1997) and Conover *et al.* (1999) report a strong positive relationship between expansionary monetary policy and stock market returns. On similar lines, Rigobon and Sack (2004), Ehrmann and Fratzscher (2004), and Sousa (2010) document a negative relationship between contractionary monetary policy and stock market performance. Segregating the magnitude of response of stock market to different changes, Basista and Kurov (2008) find variation in the response to the policy shocks during recession as compared with normal conditions in the US. They record the impact of monetary policy on stock returns of credit constraint firms.

The extant literature documents influence of the US monetary policy on asset prices (e.g. Cook and Hahn, 1989; Jensen and Johnson, 1995; Patelis, 1997; Kuttner, 2001). Thorbecke and Alami (1994) address ambiguity in literature about the effects of changes in the Federal Reserve operating procedure indicating that monetary policy has an effect on stock prices using regression based event study methodology. They suggest fall in stock returns as a result of tightening of monetary policy. Lobo (2000) establishes the relationship between monetary policy announcement and stock returns for the sample period 1990-1998 and finds effect of tightening of Fed rate or policy rate on stock returns. However, most of the studies suggest a strong negative relationship between monetary policy innovations and stock market performance in the US. Similar negative relationship between decisions of central bank and financial markets are reported for the UK (Bredin *et al.*, 2007) and Europe (Bohl *et al.*, 2008; Kholodilin *et al.*, 2009).

Objectives of the study:

The specific objectives of the study include to:

1) To investigate the impact of monetary policy on stock returns
2) To analyze the impact of FII shocks on stock market performance in the long run.
3) To probe whether investors use stock market to hedge against inflation

Hypothesis:

1) Growth of money supply has no significant long run impact on stock market performance
2) Growth in FII has no significant long run impact on stock market performance.
3) Inflation rate has no significant long run effect on stock market performance.

METHODOLOGY

This study is designed to analyze the effects of monetary policy on Indian stock market performance. Its primary objective is to correctly establish the way in which monetary policy affects the stock markets. It further seeks to determine the extent to which changes in money supply, interest rates and inflation rate affect growth of stock market capitalization over the short, medium and long run period in the country. The data used for this research is obtained from the World Bank, RBI website, the International Financial Statistics, a publication of the International Monetary Fund (I.M.F) and NSE India. For the purpose of this research work, secondary data was collected and used. The variables used are: growth rate of money and quasi money supply, RR, lending rate, inflation rate at consumer price and stock market capitalization. The data collected covers the period between 1995 April and 2016 March. For the purpose of our analysis, the variables used to measure the effects of monetary policy on stock market performance are broad money (M3), Foreign Institutional Investments (FII), inflation rate at consumer price index and market capitalization.

Econometrics model:

In this study, we use the S and P CNX Nifty 50 index, Sensex as a proxy for stock market returns. This study also explores the relevant issues using firm level data. Nifty is the barometer of Indian stock market with 65 per cent of free float adjusted top market capitalized and most liquid securities traded on the National Stock Exchange (NSE). It is 12th largest stock exchange of the world with market capitalization of US$1.65 trillion (World Federation of Exchanges, 2015).

In this model, we express growth rate of stock market capitalization (M) as a function of broad money growth (G), RR growth (RR) FIIs growth (F) and inflation rate (I). Growth rate of market capitalization is obtained by taking the log of market capitalization.

Therefore, the functional relationship between the variables is expressed as follows: Mt= f (Gt, RRt, Ft, t) For the vector autoregression, the reduced forms VAR methodology is used. The equations for the four variables are specified as follows:

Growth rate of market capitalization :

$$M_t = {}_{0i} + \sum_{i=1}^{n} {}_{1i}G_{t-i} + \sum_{i=1}^{n} {}_{2i}F_{t-i} + \sum_{i=1}^{n} {}_{3i}I_{t-i} + \sum_{i=1}^{n} {}_{4i}M_{t-i} + \sum_{i=1}^{n} {}_{5}RR_{t-i} + £_{1t} \ldots\ldots(1)$$

Repo rate:

$$RR_t = {}_{0i} + \sum_{i=1}^{n} {}_{1i}G_{t-i} + \sum_{i=1}^{n} {}_{2i}F_{t-i} + \sum_{i=1}^{n} {}_{3i}I_{t-i} + \sum_{i=1}^{n} {}_{4i}M_{t-i} + \sum_{i=1}^{n} {}_{5}RR_{t-i} + £_{1t} \ldots\ldots(2)$$

FII growth :

$$F_t = {}_{0i} + \sum_{i=1}^{n} {}_{1i}G_{t-i} + \sum_{i=1}^{n} {}_{2i}F_{t-i} + \sum_{i=1}^{n} {}_{3i}I_{t-i} + \sum_{i=1}^{n} {}_{4i}M_{t-i} + \sum_{i=1}^{n} {}_{5}RR_{t-i} + £_{1t} \text{.....(3)}$$

Broad money growth :

$$G_t = {}_{0i} + \sum_{i=1}^{n} {}_{1i}G_{t-i} + \sum_{i=1}^{n} {}_{2i}F_{t-i} + \sum_{i=1}^{n} {}_{3i}I_{t-i} + \sum_{i=1}^{n} {}_{4i}M_{t-i} + \sum_{i=1}^{n} {}_{5}RR_{t-i} + £_{1t} \text{.....(4)}$$

Inflation rate :

$$I_t = {}_{0i} + \sum_{i=1}^{n} {}_{1i}G_{t-i} + \sum_{i=1}^{n} {}_{2i}F_{t-i} + \sum_{i=1}^{n} {}_{3i}I_{t-i} + \sum_{i=1}^{n} {}_{4i}M_{t-i} + \sum_{i=1}^{n} {}_{5}RR_{t-i} + £_{1t} \text{.....(5)}$$

where Mt , RR_t, Gt , Ft and It are (nX1) vectors representing forecast values of growth of market capitalization, broad money growth, FII growth and inflation rate, respectively.

βoi , β1i , β2i , β3i and β4i are (nXn) matrices of coefficients

Mt-I , RR_t-I, Gt-I , Lt-i and It-i are (nX1) lagged values of growth of market capitalization, money and quasi money growth, lending rate and inflation rate

ε_{1t}, ε_{2t}, ε_{3t}, ε_{4t} and ε_{5t} are a (nX1) vector of uncorrelated white noise disturbances.

The vector error correction model (VECM) equation can be specified as follows:

$$\Delta M_t = \sim_0 + 5\sim_1 \Delta G_t + \sim_2 \Delta RR_t + \sim_3 \Delta F_t + \sim_4 \Delta I_t - \sim_5 £_{t-1} \quad \text{.....(6)}$$

where ΔMt is a vector of a stationary endogenous variable (growth rate of market capitalization)

ΔGt, ΔLt , and ΔIt are vectors of stationary exogenous variables including seasonal dummies, α_0, α_1, α_2, α_3, α_4, α_5 with the exogenous variables, ε_{t-1} in both equations are error correcting terms while ìt is the random or stochastic error terms.

The parameters measure the speed at which the variables in the system adjust to restore a long-run equilibrium, and the vectors are estimates of the long-run cointegrating relationships between the variables in the model. This research work shall make use of descriptive and econometric techniques of analysis. The descriptive techniques are carried out using tables. The tables would clearly present the data and thus enhance comparison of the variables in the study. The empirical or econometric technique which will be used in this study is Vector Error Correction Model (VECM). Using the VECM technique, impulse- response and variance decomposition analysis would be performed on the data.

RESULTS AND DISCUSSION

Monetary policy attempts to achieve a set of objectives that are expressed in terms of macroeconomic variables such as inflation, real output and employment. However, monetary policy actions such as changes in the bank rate and repo rate have at best an indirect effect on these variables and considerable lags are involved in the policy transmission mechanism. Broader financial markets though, for example the stock market, government and corporate bond markets, mortgage markets, foreign exchange markets, are quick to incorporate new information. Therefore, a more direct and immediate effect of changes in the monetary policy instruments may be identified using financial data. Identifying the link between monetary policy and financial asset prices is highly important to gain a better insight in the transmission mechanism of monetary policy, since changes

in asset prices play a key role in several channels.

Stationarity and unit root tests:

Table 1 : Results of unit root test

Variables	ADF		PP	
	Level	First difference	Level	First difference
FFI	-10.83709***	-13.91810***	-10.98727***	-83.33384***
M3	-1.849018	-16.35471***	-1.848486	-16.35542***
NSE_MKT	-1.980730	-16.92453***	-2.112243	-16.91467***
RR	-2.170776	-16.29371***	-2.165428	-16.36060***
SPP	0.296593	-12.73538***	0.388612	-12.69241***
WPI	-1.614005	-16.16168***	-1.643049	-16.16177***

Notes: ADF:Augmented Dickey–Fuller PP: Phillips–Perron
The t-statistics refer to the MacKinnon (1996) one-sided p values table
* Significant at the 10% level, ** significant at the 5% level, *** significant at the 1% level

Thus we observe that all the t* > ADF critical value (5% or 10%) in their level of variable and thus are non-stationary but t* < ADF critical value (5% or 10%) for the first difference of the variable, thus variable are stationary in their first difference *i.e.* I(1). Given the unit-root properties of the variables, we proceeded to establish whether or not there is a long-run cointegrating relationship among the variables in equation (3.2) by using the Johansen full information maximum likelihood method (Johansen and Juselius, 1990).

Table 2 : Results of the Johansen Co-integration Test

Panel-A	Trace Test			
Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.171709	118.4781	95.75366	0.0006
At most 1 *	0.140512	69.87313	69.81889	0.0495
At most 2	0.065552	30.80724	47.85613	0.6768
At most 3	0.026380	13.31509	29.79707	0.8767
At most 4	0.019065	6.417713	15.49471	0.6461
At most 5	0.005610	1.451509	3.841466	0.2283
Panel-A	Maximum Eigen value			
None *	0.171709	48.60494	40.07757	0.0044
At most 1 *	0.140512	39.06588	33.87687	0.0110
At most 2	0.065552	17.49215	27.58434	0.5379
At most 3	0.026380	6.897377	21.13162	0.9578
At most 4	0.019065	4.966204	14.26460	0.7461
At most 5	0.005610	1.451509	3.841466	0.2283

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 results of the cointegration test are reported in Table above. The results reported the trace and maximum eigenvalue statistics. These results reveal that the null hypothesis of no-cointegrating vector between real monetary policy, stock market capitalisation and foreign capital

inflows components is rejected at the 5% level of significance. The trace test statistics show that there is one cointegrating relationship. The maximal eigenvalue statistics reveal three cointegrating relationships among stock market capitalization (M) as a function of broad money growth (G), RR growth (RR) FIIs growth (F) and inflation rate (I) Johansen and Juselius (1990) recommend the use of the trace statistics when there is a conflict between the trace statistics and maximal eigenvalue statistics. Since the trace statistics takes into account all of the smallest eigenvalues, it possesses more power than the maximal eigenvalue statistic (Serletis and King, 1997; and Kasa, 1990). The conclusion drawn from this result is that there exists a unique long-run relationship between Stock market capitalization (M), Broad money (G), Repo Rate (RR) FIIs (F) and inflation (I).

Lag Selection Procedure:

Before preceding unit root, co-integration and vector error correction test, we investigated the most appropriate lag selections through applying VAR lag order selection criteria. Likelihood Ratio (LR), Final prediction Error (FPE), Log likelihood (LogL), Akaike information, Schwars information and Hannan – Quinn information criteria have been separately calculated.1 lag level have been commonly selected for a group of statistics. Following the lag order selection test monetary policy and macroeconomic variables relationship in India have been analyzed in India. Vector auto-regression model is estimated from 1995 January to 2016 March.

Table 3 : VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-14646.29	NA	2.09e+42	114.4710	114.5541	114.5044
1	-12557.70	4062.961	2.26e+35	98.43513	99.01676*	98.66906
2	-12494.78	119.4505	1.84e+35*	98.22481*	99.30498	98.65925*
3	-12476.16	34.46664	2.11e+35	98.36063	99.93935	98.99559
4	-12447.57	51.60038	2.24e+35	98.41851	100.4958	99.25397
5	-12416.15	55.23205*	2.32e+35	98.45428	101.0301	99.49026
6	-12394.02	37.85995	2.60e+35	98.56265	101.6370	99.79914
7	-12370.85	38.55763	2.90e+35	98.66288	102.2358	100.0999
8	-12350.94	32.20050	3.32e+35	98.78857	102.8600	100.4261

* indicates lag order selected by the criterion LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error AIC: Akaike information criterion SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Regression results:

In order to determine the effects of monetary policy on stock market performance, the model specified in chapter three is estimated using the technique of Vector Error Correction Model (VECM). The vector autoregression (VAR) model is a general framework used to describe the dynamic interrelationship between stationary variables. So, the first step in your analysis should be to determine whether the levels of your data are stationary. If not, take the first differences of your data and try again. Usually, if the levels (or log-levels) of your time series are not stationary, the first differences will be.

Generally, the response function shows the responses of a particular variable to a one-time shock to each of the variables in the system (Ajilore, 2002). The study examines market growth as the response variable and examines the effects of one standard deviation shock of growth of broad money supply, FII growth rate and inflation rate on growth of market capitalization. However, the

impulse response graph shows the result when all the variables are taken as impulses and as response variables.

The forecast variance decomposition measures the degree of the variation of each of the variables to its own shocks and shocks from other variables in the model. Again, in order to reduce the size of this work, it only examines the decomposition of variance of growth of market capitalization (M) to its own shocks and shocks from growth of broad money supply (G), FII growth rate and inflation rate (I).

Table 4 : Estimates of the Error-Correction Model

Cointegrating Eq:	CointEq1				
RR(-1)	1.000000				
M3(-1)	-3.03E-06				
	(2.9E-06)				
	[-1.04853]				
NMC(-1)	4.58E-06				
	(2.6E-06)				
	[1.74850]				
FFI(-1)	0.001652				
	(0.00034)				
	[4.88685]				
WPI(-1)	-7.74E-05				
	(0.02676)				
	[-0.00289]				
C	-15.82403				
Error Correction:	D(RR)	D(M3)	D(NMC)	D(FFI)	D(WPI)
CointEq1	0.007586	-8346.952	-11217.34	-285.3437	0.125864
	(0.00328)	(3080.24)	(3695.08)	(54.3689)	(0.11495)
	[2.31246]	[-2.70984]	[-3.03575]	[-5.24829]	[1.09497]

In the short-run, deviations from the long-run relationship established in panel C of Table 4 could occur due to shocks to any of the variables. In addition, the dynamics governing the short-run behavior of the model are different from those in the long-run. Due to this difference, the short-run interactions and the adjustments to long-run equilibrium are important because of the policy implications.

The results of the parsimonious short-run dynamic of the model and the various diagnostic tests are presented in Table 4 above. As expected, the error correction term (ECTt-1) is of the expected negetive sign and highly significant. This result substantiates the finding of cointegration among the variables reported earlier, but more importantly, it suggests that one cannot overlook the cointegrating relationship among variables in the model; otherwise, this could introduce misspecification in the underlying dynamic structure. The error correction term for changes in monetary policy is highly significant even at the one per cent level.

The diagnostic tests reported in Table 4 above show that there is no evidence of diagnostic problem with the model. The coefficient of determination (adjusted R2) used in measuring the goodness-of-fit of the estimated model, indicates that the model is reasonably accurate in prediction. Looking at the probability value of the Jarque-Bera (JB), which is given in the bracket, the null hypothesis of normally distributed residuals cannot be rejected.

The Lagrange Multiplier (LM) test of no error autocorrelation suggests that the residuals are not serially correlated. The Autoregressive Conditional Heteoskedasticity tests [ARCH (4)] reveal that the disturbance term in the equation is homoskedastic. The Ramsey RESET test result shows that the calculated F-value is less than the critical value at the five per cent level of significance. This is an indication that there is no specification error.

Impulse response analysis:

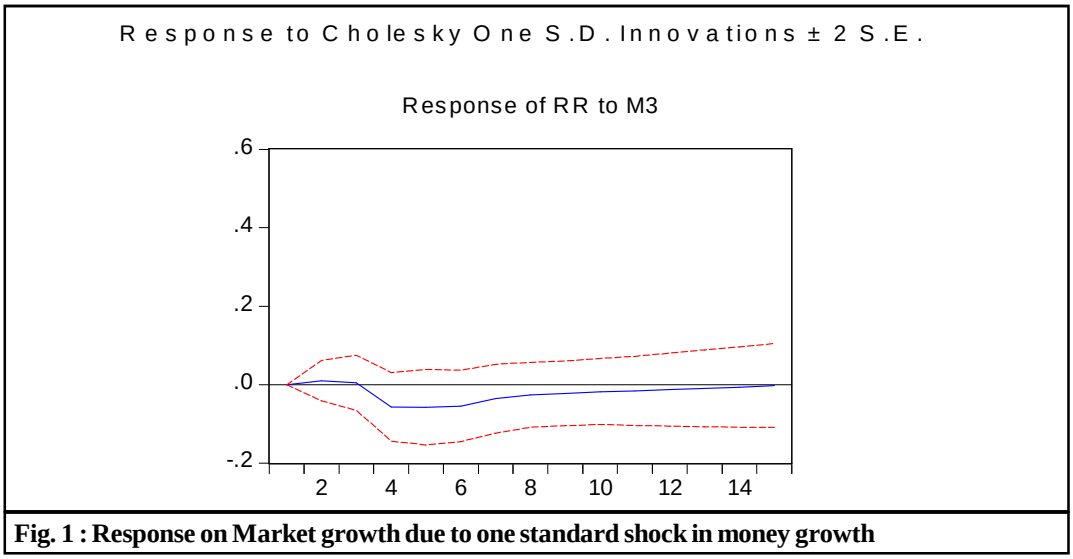

Fig. 1 : Response on Market growth due to one standard shock in money growth

The graph above depicts the impulse response of growth rate of market capitalization of the model for India using a horizon of 15 months. The above figure shows that when there is change in money growth due to changes in policy *i.e.* Repo Rate it effects stock market negatively in the short run (period 1 to 3) and gradually market declined to it and impact is positive in the long run from.

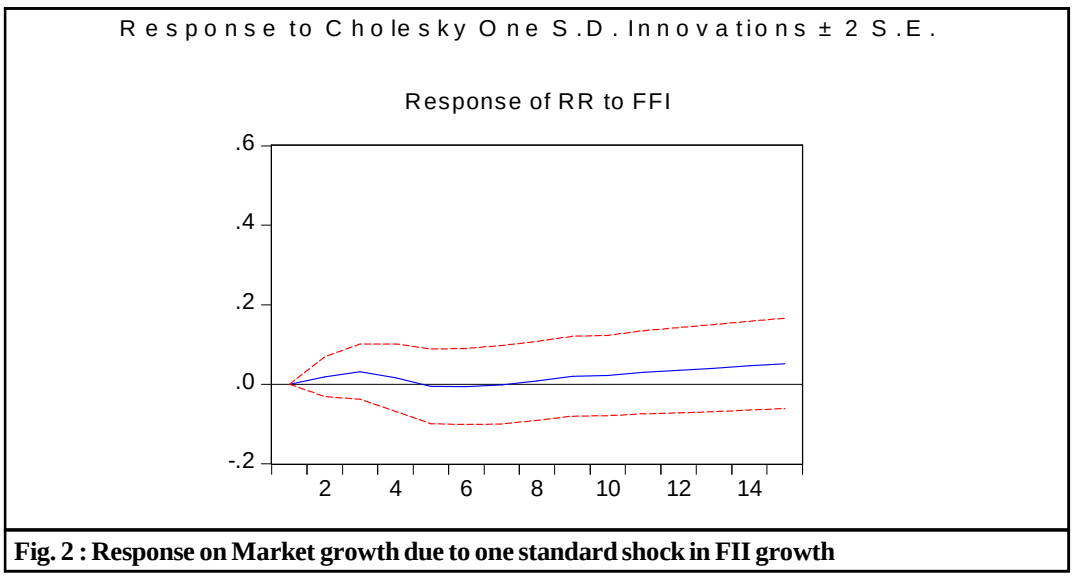

Fig. 2 : Response on Market growth due to one standard shock in FII growth

The above figure shows that when there is change in FII growth due to changes in investor sentiments, favorable domestic conditions it affects stock market positively in the short run (period 1 to 7) and long run. Market gradually market adjusts to the change in the 8-15th period.

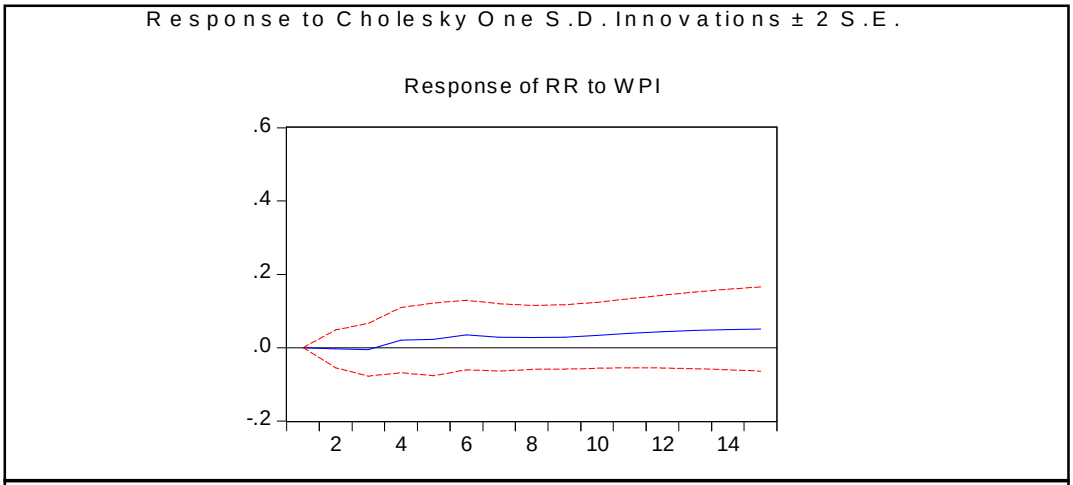

Fig. 3 : Response on Market growth due to one standard shock in inflation rate

In the case of inflation rate as the impulse variable, the response of growth of market capitalization a one standard deviation shock to lending rate was negative in the first three periods but is generally oscillating and requires time to adjust to the change in sudden volatility in prices so that it increases in high manner.

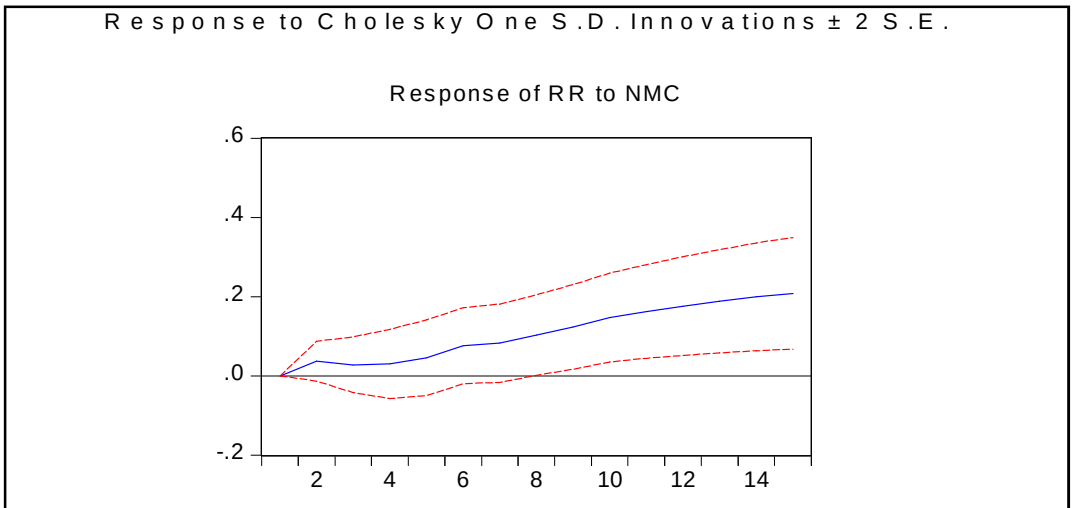

Fig. 4 : Response on Market growth due to one standard shock in Stock market capitalization

The graph above depicts the impulse response of growth NSE market capitalisation of the model for India using a horizon of 15 months. The above figure shows that when there is change in its expected return due to changes in policy *i.e.* Repo Rate it affects stock market positive in the short run (period 1 to 15) and gradually market adjusts to it and impact is positive in the long run in

continuous manner.

Decomposition of variance analysis:

Here, the sensitivity of the variables are considered. In doing this we employ a ten year forecasting (in-sample forecast) time horizon and observed the relevance of the variable over time horizon. However, only variance decomposition of Repo Rate is shown because of space.

Table 5 : Variance Decomposition of Repo Rate

Period	S.E.	RR	M3	NMC	FII	WPI
1	0.396686	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.548979	99.38689	0.033173	0.456566	0.120039	0.003330
3	0.685694	99.21901	0.026412	0.456272	0.289572	0.008732
4	0.759956	98.52841	0.578856	0.529600	0.282138	0.080998
5	0.817132	97.83993	0.992877	0.770316	0.248062	0.148811
6	0.865948	96.75042	1.276123	1.455214	0.225501	0.292744
7	0.908905	95.97667	1.312380	2.144700	0.204919	0.361331
8	0.952202	94.99960	1.270310	3.120509	0.194054	0.415527
9	0.994780	93.70451	1.214423	4.396149	0.218318	0.466600
10	1.039152	92.04444	1.141821	6.034917	0.245140	0.533676
11	1.082847	90.18688	1.073502	7.810608	0.304024	0.624989
12	1.125890	88.21972	1.005507	9.666461	0.379552	0.728764
13	1.168248	86.17307	0.940423	11.57297	0.472441	0.841098
14	1.210232	84.07986	0.879129	13.50097	0.589051	0.950996
15	1.251789	82.01183	0.822005	15.38592	0.724730	1.055517

Cholesky Ordering: RR, M3, NMC, SPP, FFI, IIP, WPI

Above table spells that the fraction of the forecast error variance for each variable that is attributed to its own innovation and to innovations in another variable. The own shocks of the monetary policy constitute a significant source of variation in growth forecast error in the time horizon, ranging from 100% to 75%. Fifteen years after, variation in growth are accounted by broad money (82%) and FII (72) shock while that of market capitalization (15%) is relatively large in India over the sample period. The salient feature of this is that the predominant sources of variation in growth are broad money and Foreign Institutional Investment. Similar explanations hold for the variations in growth in the other forecast periods.

Conclusion:

Based on the analysis performed above and the impulse response graphs drawn, it can be interpreted that money growth in addition to market growth is the major determinant of stock market performance since it is the major variable that determines stock market performance in the long run. This is followed by FII growth and inflation rate which were secondary determinant affecting the stock market of India. The short run, medium run and long run equilibrium relationships between the four variables has been examined and these would be useful in giving appropriate policy recommendations to central bankers for better formulation of monetary policy for stock market stability and growth. The three hypotheses of the study were rejected based on the evidence provided by our analysis because broad money growth, FII growth and inflation rate all had significant long run relationships with stock market performance. Inflation rate did not really influence much

variation in stock market performance contrary to many of the literature reviewed, but stock markets still responded to changes in inflation rate. This research work postulates that stock market factors (such as investors' confidence) and money supply in the economy are the major determinants of stock market performance.

In conclusion therefore, central bank officials should make conscious effort to determine the principal determinants of stock market performance in their various countries and implement appropriate policies that would enhance the development of their stock markets. The "one rule fits all" notion has been shown to be invalid in this study as what works in one country may fail in another. Ioannidis and Kontonikas (2006) asserted that the existence of a relationship between monetary policy and stock market performance has important implications for both stock market participants and central bankers since, with respect to the former, this issue relates to the broader topic of stock price determination and portfolio formation; while the latter are interested in whether monetary policy actions are transmitted through financial markets. Monetary policy makers *i.e.* RBI have to pay close attention to this relationship in order to formulate policies that would lead to long run growth and stability of financial markets in general and the stock market in particular.

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