

**The Response of Market and Foreign Portfolio Investors on Economic Slowdown:
Evidence from India**

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Abstract

Economic slowdown is a situation where decline in the growth of the GDP (Gross Domestic Product) of the nation which leads the nation to rise in unemployment and decline in productivity. The India's GDP growth is running down from past six quarters. The Foreign Portfolio Investors (FPIs) are remained as net sellers in majority of the times in the period. This study intends to analyse the influence of FPIs on Indian Stock market in the current economic slowdown condition. The study uses daily data of FPI flows, Nifty and exchange rate to analyse the influence of FPIs on Nifty at test period. The GARCH(1,1) model to resulted that the market is responding to the recent news in the economy rather its own past volatility at present economic slowdown condition in India.

Key Words: Economic Slowdown, FPIs, GARCH, Recent News, Volatility

Introduction

Today, the buzz is 'economic slowdown' or 'economic meltdown'. These words we have been hearing from past two years in India. Politicians, Business men, economists were speaking about the issues, all over the news channels and in print media. Economic slowdown is a situation where decline in the growth of the GDP (Gross Domestic Product) of the nation which leads the nation to rise in unemployment and decline in productivity. National Bureau of Economic Research (NBER) a private economic research organisation

from United States, defines economic recession as: “a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in real GDP, real income, employment, industrial production, and wholesale-retail sales”. The determination of NBER for the precise dating economic recession has been accepted universally, by academics, economist, policy makers and businesses (Recession, 2019). This is the situation in India today. The growth of the nation’s GDP is declining from past six quarters.

Indian economy has characterised as a developing market economy. The economy is the world’s fifth largest economy by nominal GDP and third largest by nation’s purchasing power parity (PPP). The IMF (International Monetary Fund) 2018, ranked India as 142 and 119 in terms of per capita income on GDP(nominal) and GDP(PPP) respectively. Since Independence until 1991, the successive governments are protected economy of the nation through extensive state intervention and regulation. The Balance of Payment (BoP) crisis in 1991 led the economy to adopt liberalisation. The GDP tends to rise six to seven per cent in the 21st century and termed as world’s fastest growing major economy. The young population and corresponding low dependency ratio, health savings, investment rates and increasing integration with global economy made India to remain positive in economy. Today, this great economy is melting down.

In this paper, let us discuss about the economic crunch and responses of the foreign investors towards Indian market. The next part of the study reviews some of the news which projects economic slowdown in India. The objective and methodology of the study is covered in the third section. The fourth section discusses the result and interpretation. The paper will be concluded with remarks in the fifth section.

Review of available News

As discussed in the introduction part of the paper, this section reviews some of the newspaper articles which covered latest news related to economic slowdown. Initially, there was the

voice against sectoral slowdown like slowdown in automobile industry, manufacturing industry, FMCGs (Fast Moving Consumer Goods), etc. It was opined that, the economy started slow down after 'demonetisation' in 2016 and GST (Goods and Service Tax) in 2017. Former Governor of Reserve Bank of India Raghuram G. Rajan has expressed his view to 'India Today' in the month of October (2019), that "ill-conceived demonetisation and poorly executed GST roll-out" are the two key reasons behind present economic slowdown. He opined that the sequence of demonetisation and GST are introduced when the economy was relatively weak. He added, the country is facing a serious demand crunch with decline in macro numbers. Amit Kapoor (2019), reported to 'The Economic Times' on September (2019), the RBI reported that the GDP growth rate has been slipped to five per cent in the first quarter of the financial year 2019-20 the lowest over six years. The collapse of automobile sector, downing in consumer sector, failing manufacturing sector resulted in job losses right from automobile industry to biscuit manufacturing sector. There are many manufacturing and automobile units are shuttered from last six quarters. IMF Chief Managing Director Kristalina Georgieva expressed that 90 per cent of the world economy having slower growth in 2019, it is reflecting in India and Brazil (Bureau, 2019). Meanwhile, Foreign Portfolio Investors (FPIs) started to pull their investment from Indian market. They pulled out a net amount of Rs.6,217.1 crore between first October to eleventh October from both debt and equity market (PTI, 2019b). FPIs remained under pressure on the announcement of tax surcharge on them by the government. The Finance Minister Nirmala Sitharaman announced this new regulation in her maiden budget, which led to outflow of Rs.8,319 crore on net basis in the first half of August (BusinessToday.in, 2019). Prior to that FPIs pulled their money Rs.3,758.44 crore between July 1st to 26th (PTI, 2019a). By reviewing some of the news about FPIs pull outs it seems to be necessary to study the responses of FPIs on economic slowdown in India.

Research Methodology

The objective of the present study is to analyse the response of foreign investors' towards economic meltdown in India and the effect of their response to Indian stock market. To achieve the objective stated, the study used recent six quarters(5/04/2018 to 30/09/2019)of daily data of FPI flows (Gross Purchases and Sales), exchange rate and Nifty closing values to construct a model of estimation. The six quarters data of GDP is collected from Ministry of Statistics and Programme Implementation, daily FPI flows data from National Securities Depository Limited (NSDL) and Nifty closing prices from Nifty index of National Stock Exchange (NSE).

The study used Generalised Autoregressive Conditional Heteroscedasticity (GARCH) model to estimate the desired objective. The model GARCH is the combination of two equations, one is mean equation another is variance equation. The GARCH(1,1) model of the study represents as;

Conditional Equation for mean:

$$Nifty_t = \varphi_1 + FPI\ GP_t^1\lambda_1 + FPI\ GS_t^1\lambda_2 + \varepsilon_t \quad \dots\dots\dots (1)$$

Conditional Equation of variance:

$$\sigma_t^2 = \gamma + \alpha\varepsilon_{t-1}^2 + \beta\sigma_{t-1}^2 + \rho Exchange\ Rate_t$$

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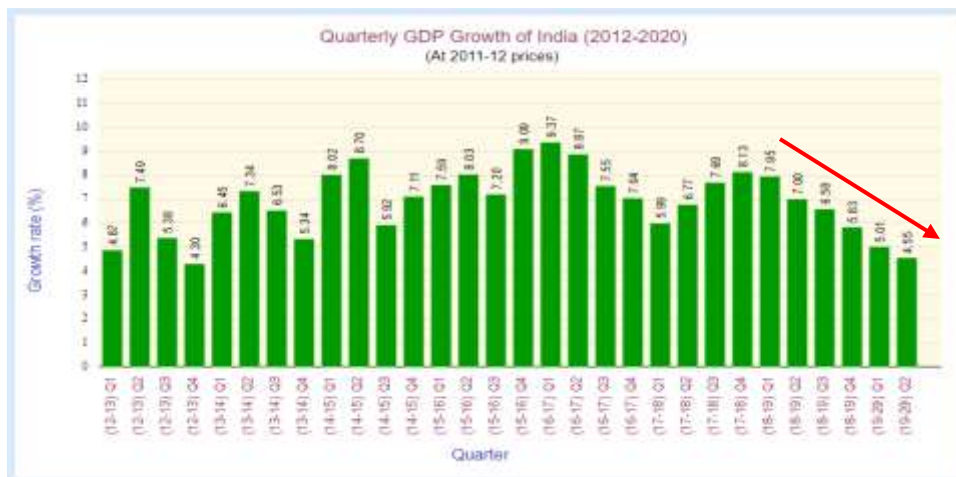
assumed : $\gamma > 0, \alpha \geq 0, \beta \geq 0, \rho \geq 0$

where, γ is intercept, ε_{t-1}^2 is the conditional mean termed as short-runvolatility from the lag of the squared error (ε_t) term from the mean equation. The term σ_t^2 and σ_{t-1}^2 is the forecast and lagged conditional variance respectively (Murali, 2015). ε_{t-1}^2 and σ_{t-1}^2 termed as ARCH and GARCH term accordingly. α, β and ρ indicates corresponding coefficients and γ represents constant in the model.

Results and Discussion

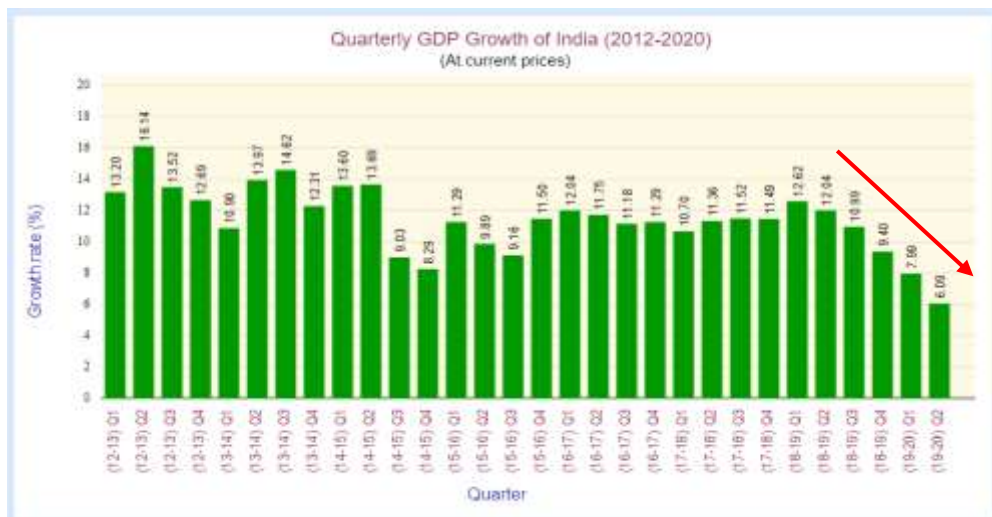
The Figures below describes the quarterly GDP growth rate of India from year 2012-13 to 2019-20 which extracted from Ministry of Statistics and Programme Implementation. It shows downward trend from past six quarters in the economy at constant and current price of GDP.

Figure 1: Quarterly GDP of India from 2012 to 2020 at constant prices



Source: Statistics Times

Figure2: Quarterly GDP of India from 2012 to 2020 at Nominal prices



Source: Statistics Times

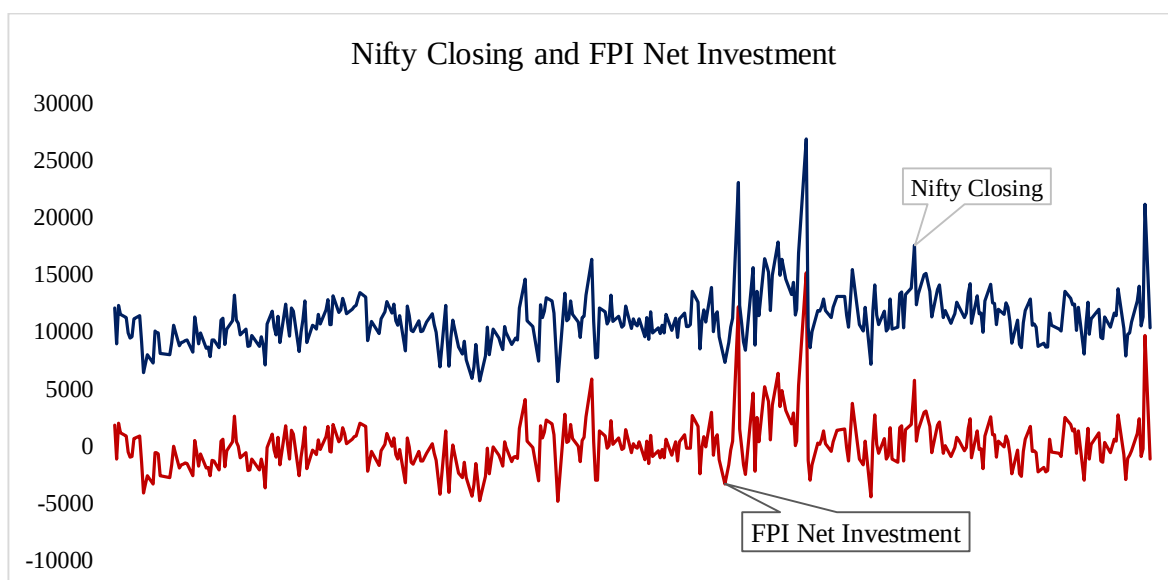
Figure 3: Quarterly GDP of India from 2012 to 2020 at Nominal prices



Source: Statistics Times

The above figures evidencing the decline growth of GDP from past six quarters. The decline in GDP indicates decline in economy.

Figure 4: Nifty Closing and FPI Net Investment data for past six quarters



Source: Authors' Computation

Figure 4 shows the data of Nifty closing values and FPI Net Investment (Gross purchases – Gross Sales) for past six quarters. Figure clears that FPIs are tend to be Net seller during the period. They pull out their investment from Indian market during the period of economic slowdown and tax surcharge announcement.

Augmented Dickey Fuller (ADF) Test of Unit Root

The employed series are tested under ADF unit root test to check the stationarity of the series as it mandate that the series must follow stationarity to form any econometric model (Brooks, 2008). The test result shows in Table 1, is that the series are integrated (I) at first order. They tends to be stationary at I(1) order. The result as follows;

Table 1: Unit Root Test Result

Table 1: ADF Test Result				
	At Level		At I(1) Order	
Variable	t-statistic	Prob.	t-statistic	Prob.
FPI Gross Purchases	0.094	0.708	-8.610	0.000*
FPI Sales	-0.105	0.643	-8.385	0.000*
Nifty Closing	-0.440	0.519	-7.088	0.000*
Exchange Rate	0.906	0.900	-7.398	0.000*

Table 2: Descriptive Statistics

Table 2 presents the distributional properties of daily observations of CNX Nifty, FPI flows and Exchange rate.

Table 2: Descriptive Statistics						
Variables	Mean	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.
FPI Gross Purchases	7132.1	3156.0	2.6	10.2	200.2	0.0
FPI Sales	7169.1	2254.0	2.4	11.3	240.1	0.0
Nifty Closing	11224.6	335.8	0.5	2.1	4.7	0.1
Exchange Rate	70.3	1.3	0.1	1.3	7.5	0.1

The descriptive statistics of the series shows that the series follow positive mean and standard deviation from the mean. The positive skewness presented for all the series. The Kurtosis are greater than three for FPI flows indicates fat tailed and avoids normality condition of the series which further proved in Jarque-Bera test and its probability values. The Nifty closing and exchange rate are following normality where Kurtosis is less than three and Jarque-Bera statistics proves at significant.

ARCH-LM test of Heteroscedasticity

To estimate GARCH(1,1) model it is essential that the mean model must follow volatility clustering the their nature. The residuals obtained from the mean model to be tested under ARCH-LM test of heteroscedasticity to check the volatility in the model estimated (Brooks, 2008). The null hypothesis (H_0) of the test is there is no ARCH effect upto q lag of the residuals. The ARCH effect is tested under following regression:

$$\varepsilon_t^2 = \phi_0 + \sum_{t=1}^q \phi_t \varepsilon_{t-q}^2 + \mu_t \quad \dots\dots\dots (3)$$

where, ε is estimated residual from mean model. The squared residuals are regressed on its own square lagged values up to q order in the above equation. Result presented in Table 3.

Table 3: ARCH-LM Test (Heteroscedasticity)

Table 3: Result of ARCH-LM Test			
F-Statistic	Prob.	LM-Statistics	Prob. χ^2
22.65932	0.0000	21.43276	0.0000

**Significant at 1per cent level*

Table 3shows the significant p-values for F and LM statistics, which indicates the presence of heteroscedasticity in the model and leads to reject the null hypothesis of no heteroscedasticity. It can be infer that Nifty series are following volatility in the presence of FPI flows. The presence of volatility indicates to estimate GARCH model in the study.

GARCH (1,1) Model estimation

Table 4 shows the results of GARCH (1,1) model used to estimate volatility in the Nifty in the present economic pressure. The coefficients obtained against FPI Gross Purchases, Sales and Exchange Rate indicates γ (constant), α (ARCH), β (GARCH) and ρ (exchange rate). The Table 4 presents the GARCH(1,1) model result.

Table 4: Estimation Result of GARCH(1,1) Model					
Variables	Coefficients	Coefficients	Std.Error	z-statistic	P-value
Constant	γ	6779.781	5536.789	1.224	0.2208
ARCH Effect	α	0.870	0.373	2.331	0.0097*
GARCH Effect	β	0.050	0.218	0.229	0.8187
Exchange Rate	ρ	-3675.114	10436.620	-0.352	0.7247
ARCH + GARCH	$\alpha + \beta$	0.920			
R-squared	-0.019766	DW Stat	1.834379		

*Significant at 1 per cent level,

Source: Authors' computation

Table 4 shows significant p-value for only to ε_{t-1}^2 which indicates lagged values of squared residuals estimated from the mean equation with the presence of FPI flows. The model estimation indicates the presence of ARCH effect on forecast variance. Further, it shows insignificant p-values for GARCH effect as well as Exchange Rate.

As discussed in the research methodology, the ε_{t-1}^2 term indicates the short-run effect on the forecast variance. The short-run effect tend to be recent information which effects on volatility of the market. The study result indicates the same, that the recent information in the economy having significant influence on market volatility. The recent economic meltdown in India significantly influencing the market. Further, foreign investors remained seller in the majority of the times during this period.

The sum of ARCH and GARCH coefficient (0.92) indicates the persistence of volatility in the model. It indicates the presence of volatility in the market. The insignificant value of

GARCH coefficient indicates that the lagged values of forecast variance is not influencing on forecast variance of the model. The past values of volatility is not finding significant influence on present volatility in the market. During this period, market is responding to the recent news rather its own past volatility. The recent news of economic slowdown along with tax surcharge announcement by Finance Minister Nirmala Sitharaman on FPI investments made FPIs to pull out their money and market remained as volatile. The insignificant p-value of exchange rate further proves that the market is responding only to recent surprises in the market during the period estimated. It proves that the economic meltdown is reflecting in Indian capital market.

Residual Diagnosis of the model

Table 5: Model Diagnosis Result

ARCH-LM Test: H ₀ : No Heteroscadasticityin residuals					
F-Statistic		Prob.	LM-Statistics		Prob.
0.090		0.765	0.093		0.760
Serial Correlation Test: H ₀ : No serial correlation presence in residuals					
Lag	Q-Stat	Prob*	Lag	Q-Stat	Prob*
1	0.098	0.754	6	-0.107	0.597
2	-0.093	0.725	7	-0.060	0.678
3	0.177	0.438	8	-0.027	0.768
4	-0.125	0.439	9	0.028	0.838
5	-0.022	0.579	10	-0.061	0.874
Normality Assumption: H ₀ : Residuals are normally distributed					
Mean	Std.Dev.	Skewness	Kurtosis	Jarque-Bera	Prob*
-0.164	0.994	0.676	4.936	14.174	0.001

Table 5 indicates the residual diagnosis result of GARCH(1,1) model of the study. The ARCH-LM test of heteroscedasticity proves that the obtained residuals are following homoscedasticity in their nature. It leads to accept the null hypothesis of no heteroscedasticity in the residuals. The serial correlation test also indicates the residuals are not serially correlated ($p\text{-value} > 0.05$ up to 10 lags). However, the model is not meeting the

normality condition. It shows residuals are not normally (p-value <0.05) distributed. It is assumed that the model estimation for time series data are exempted from normality condition.

Conclusion

The declining growth of GDP from past six quarters indicates the present slowdown in the economy. The responses of Foreign Portfolio Investors replying negatively to the slowdown. They started to pull out their investment from the market which effected the Indian stock market. The study proves that in the presence of FPIs behaviour market is tend to respond recent news in the economy. The market volatility forgotten its past volatility and started to respond to the surprise news in the economy. Therefore, the study proves Indian stock market responses to the new news in the economy.

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