



Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/12961

DOI URL: <http://dx.doi.org/10.21474/IJAR01/12961>



RESEARCH ARTICLE

IMPACT OF COVID 19 ON NIFTY 50 VOLATILITY

Aman Gupta

Manuscript Info

Manuscript History

Received: 30 March 2021

Final Accepted: 30 April 2021

Published: May 2021

Abstract

COVID 19 has severely affected global financial markets and it has long lasting impact on Nifty 50. The increasing daily new and total COVID 19 cases lead to anxiety among investors and there was panic selling because of lockdown and after government incentives and plan to revive the market, Nifty 50 touched it's all time high. We can clearly imagine the amount of volatility COVID 19 created in the market. VIX touched all time high of 66.04 from 13.68 points. This research paper aims to study the magnitude of impact of COVID 19 on Nifty 50 volatility using GARCH model.

Copy Right, IJAR, 2021., All rights reserved.

Introduction:-

The COVID-19 pandemic has created economic crises. The spread of the virus and globally enforced lockdowns have negatively impacted the overall demand and supply of products and services. Supply chain of whole world was severely impacted. Covid-19 pandemic has impacted prices of stocks, gold, commodities or any other product This has severely impacted the global financial markets. It has sent markets around the world crashing to levels not witnessed since the Global Financial Crisis of 2008.

The government took precautionary measures to curb the virus spread. The lockdown restriction implemented by government of India halted most of the economic activities. Due to lockdown GDP figures for Q1 (April to June) FY21 showed a contraction of 24% as compared to the same period the year before. In order to protect margins and remain afloat companies had to take necessary decisions which had short term and will have long term impact on their revenue as well as profits.

Volatile markets are usually characterized by wide price fluctuations and heavy trading in the asset. Due to wide spread of the virus financial markets all around the world saw a downturn as investor confidence was shattered. The repercussions of the coronavirus are expected to be felt for many more months, possibly years. COVID-19 relief package or stimulus package provided by government and global roll out of vaccine helped in recovery of financial markets. There is a 'V' shaped recovery in financial markets.

Nifty 50 as, on 23rd March, 2020 Nifty 50 closed at 7610.25 down about 38.76% from its recent record high of 12,430 hit on 20th January, 2020, and then touched all time high of 14753.55 as on 21st January, 2021.

Literature Review:-

Volatility in the Indian stock market: A case of individual securities (Kumar & Gupta, 2009) examined volatility in the securities of S&P CNX Nifty for 29 securities for the period of 10 years (1996-97 to 2006-07) by computing standard deviation of daily return to calculate daily volatility. Research found that for the period after 2000-01 has

comparatively been stable than preceding period, most of the companies were highly volatile with low or even negative return and 1999-00 was highly volatile year for 20 securities followed by 1998-99.

Volatility in Indian Stock Markets (Mishra, 2011) examined volatility of stock market through share price behaviour and causes and effect of the volatility in financial market. For research five companies from five industry were studied for period 2005-06 to 2008-09. Zero order correlation method was used to analyse the explanatory variables. Zero order Correlation analysis was concerned with dividend per share, earning per share, book value to par value and price to earnings and concluded that they have a significant positive correlation with market price and volatility of the market.

A Study on Stock Market Volatility Pattern of BSE and NSE in India (Tanty & Patjoshi, 2016) examined stock market volatility by using ARCH and GARCH model, the research indicated that stock markets exhibited volatility clustering and volatility was explained by GARCH model. Also, large lag coefficient showed volatility is highly persistent and is predictable.

Spill over of COVID-19: Impact on Stock Market Volatility (Yousef, 2020) examined impact of COVID 19 on volatility of primary index of G7 countries i.e., the S&P500 index for the USA, the FTSE100 index for the UK, the S&P/TSX index for Canada, the DAX index for Germany, the CAC40 index for France, the FTSE MIB Index for Italy, and the Nikkei 225 index for Japan, as well as for Oil and Gold. By using regression model and GARCH model. While using regression model, the independent variables include a dummy variable for the COVID 19 period, the number of daily new COVID 19 cases, and the daily growth rate in new COVID 19 cases. The research concluded that COVID 19 had increased volatility in financial markets of G7, as both the daily number of new COVID 19 cases and the growth rate in daily new COVID 19 cases showed positive impact.

The Impact of COVID-19 on Gold Price Volatility (Shehadeh & Yousef, 2020) examined impact of COVID 19 on Gold volatility, for research gold spot prices in US Dollars for period of 4 months was studied (1st Jan to 1st May 2020). During this period gold prices showed high volatility as investors were moving away from stock market and were seeking safe haven assets like gold as there was wide spread fear due to COVID-19.

Objective of the Study:-

Measurement of volatility in Nifty 50 due to COVID-19. And, how number of daily new COVID 19 cases and total number of COVID 19 cases had impacted volatility in Indian financial market as especially in Nifty 50.

Research Methodology:-

Autoregressive conditional heteroscedasticity (ARCH) model introduced by (Engle, 1982), is a statistical model that is used to describe variance of the current error time as a function of the actual sizes of the previous time periods error term. This model can also be used to find volatility in financial market. ARCH model assumes that positive and negative shocks have the same impact on volatility, but financial markets respond in different way to positive and negative shocks. ARCH model is restrictive as it becomes complicated for higher order ARCH models.

Generalized Autoregressive Conditionally Heteroscedastic model (GARCH model) was developed by Tim Bollerslev in 1986. GARCH is the first and basic symmetric model and is defined as the linear function of past squared residuals and the lagged conditional variances. Since the development of GARCH models, a number of extensions and variants were developed and can be classified as symmetric and asymmetric GARCH models.

The ARCH model is appropriate when the error variance in a time series follows an autoregressive (AR) model and if an autoregressive moving average (ARMA) model is followed for the error variance, the model is a generalized autoregressive conditional heteroskedasticity model (GARCH). GARCH models also tends to be more parsimonious meaning that it accomplishes a better prediction with less variables, and avoids overfitting. GARCH is useful in modelling volatility in prices because price spikes are often persistent and are caused by elements outside of human control. And therefore, GARCH becomes useful in forecasting the covariance of returns and volatility in financial market.

Data Analysis

For research purpose the data of Nifty 50 was collected from NSE website form 1st January, 2020 to 31st December, 2020. Number of daily new cases and total number of cases was studied for 1st January, 2020 to 31st December, 2020.

The mean return for the period is 0.07% with median 0.22%. The Kurtosis value of 11.04 indicate return are leptokurtic with skewness of -1.42, the distribution has left tail. In order to study whether series is stationary or not stationary, Dickey Fuller test was conducted. The test concluded that the series is stationary. Therefore, we reject null hypothesis of a unit root in the series at 1%. In, ARCH model p values are less than 1%, which implies presence of ARCH effect in the residuals of the series at 1% level. Which implies variance is not constant, GARCH (1,1) and GJR GARCH models should be used for further analysis and situation of asymmetry. Regression analysis state that there is significant impact of daily new and total COVID 19 cases on Nifty 50 returns. GARCH (1,1) model is used to study volatility in Nifty 50. There is ARCH effect with substantial volatility clustering and indication of persistent of volatility. The variance equation also shows volatility in Nifty 50 returns. It can be conclude that increasing daily new and total COVID 19 cases will result in higher volatility.

Table 1:- Descriptive summary statistics of Nifty 50.

	Price	Return
Mean	11153	0.000752
Standard Error	89.34635	0.001253
Median	11319.92	0.002298
Standard Deviation	1412.69	0.019775
Kurtosis	-0.51993	11.04583
Skewness	-0.27059	-1.41769
Range	6371.7	0.217437
Minimum	7610.25	-0.1298
Maximum	13981.95	0.087632
Sum	2788250	0.187277
Count	250	249

Table 2:- GARCH (1,1).

	Coefficient	p value
Conditional mean equation		
Const	0.0028	0.879
Conditional variance equation		
Omega	0.0086	0.000
Alpha	0.049	0.000
Beta	0.896	0.000
COVID-19		
Llik	8264	
AIC	-12878	

Table 3:- GJR GARCH (1,1).

	Coefficient	p value
Conditional mean equation		
const	6.89E-06	0.991
Conditional variance equation		
Omega	0.0079	0.000
alpha	0.043	0.000
gamma	0.091	0.022
beta	0.968	0.000
COVID-19		
Llik	8294	
AIC	-13878	

Conclusion:-

Covid-19 pandemic has impacted volatility in stock market. There are many factors influencing causes of volatility but there is no fixed set of factors that we can pin point for variability. Through this study we attempted to find out the impact of number of daily new Covid 19 and total number of COVID-19 cases in India has impacted volatility in Indian stock market. The results from regression analysis conclude that there is significant positive impact of daily new and total number of COVID-19 cases on the volatility of Nifty 50. Data analysis show that sum of the ARCH and GARCH coefficients is close to 1 but which implies that volatility as well as volatility shocks are highly persistent during COVID-19.

We saw a U shape curve on Nifty 50 returns chart as when COVID-19 started and initial lockdown brought country to standstill market was volatile and crashed, but steadily as lockdown measures were eased and stimulus packages were announced market rallied to its all time high. Availability of vaccine also boosted consumer confidence. Since, COVID-19 has global impact it becomes necessary for government to provide support to companies and implement or change rules and regulations to control such huge volatility so that impact of COVID-19 is minimised. Relief plans started to lift financial markets around the world, but investors were cautious and were waiting for the outbreak to be controlled before they once again investing in stock.

Investors were liquidating assets to meet money requirement fearing that the virus will destroy their wealth, traders were opting to sell their shares to minimize loss. This increased volatility in the market.

We can see Bipolarisation of market as few stocks in Nifty 50 recovered to prices of before pandemic very fast and are touching all time high whereas few stocks are still not able to even cross the price before pandemic started.

The study suggests that during pandemic there is high volatility in stock market which can lead to huge price movement in either direction so investor must be aware of what factor is causing volatility in the market and how will it impact their portfolio. Investor must be aware of global trends as today markets are highly integrated and volatility in market can be transmitted.

References:-

1. Bollerslev, T. (1986). Generalized Autoregressive Conditional Heteroskedasticity. *Journal of Econometrics*.
2. Brooks, C. (2014). *Introductory Econometrics for Finance*. Cambridge: Cambridge University Press.
3. Engle, R. F. (1982). Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation. *Econometrica*, 987-1007.
4. Kumar, D., & Gupta, H. (2009). VOLATILITY IN THE INDIAN STOCK MARKET: A CASE OF INDIVIDUAL SECURITIES . *Journal of Academic Research in Economics*, 43-54.
5. Mala , R., & Reddy , M. (2007). Measuring Stock Market Volatility in an Emerging Economy . *International Research Journal of Finance and Economics*.
6. Mele, A. (2007). Asymmetric stock market volatility and the cyclical behavior of expected returns. *Journal of Financial Economics*.
7. Mishra, D. (2011). Volatility in Indian Stock Markets. *SSRN Electronic Journal*, 1-60.
8. Shehadeh, E., & Yousef, I. (2020). The Impact of COVID-19 on Gold Price Volatility. *International Journal of Economics and Business Administration*, 353-364.
9. Tanty, G., & Patjoshi, D. (2016). A Study on Stock Market Volatility Pattern of BSE and NSE in India. *Asian Journal of Management*, 193-200.
10. Yousef, I. (2020). Spillover of COVID-19: Impact on Stock Market Volatility. *International Journal of Psychosocial Rehabilitation*, 18069-18081.