MARKET MOVEMENT ANALYSIS WITH REFERENCE TO BSE SECTORAL INDICES

Dr. L. VIJAYA KUMAR M.Com., M.Phil. MBA, PGDHRM., B.Ed., Ph.D
Head of the Department,
Department of Information Systems Management, Ramakrishna Mission Vivekananda
College, Evening College (Autonomous),
Mylapore, Chennai - 600004.

Abstract

The present study is an attempt to find out the market movement analysis of selected sectoral Indices namely BSE Capital Goods, BSE Consumer Goods, BSE FMCG and BSE Metal Indices listed in Bombay stock Exchange (BSE). To analyse Index movement of Selected Sectoral Indices Listed in Bombay Stock Exchange, Descriptive Analysis, Augmented Dickey Fuller Test (ADF), Phillips Perron Test for Stationarity (PP), Normality test using Kolmogorov- Smirnov and Shapiro - Wilk Test, ARCH and GARCH model during the study period 01st April 2005 to 31st March 2017 of selected Sectoral Indices listed in Bombay Stock Exchanges were used. The findings of the study indicated that there is a change in the price, the investors can easily identify the risk in the market and time.

Keywords: Market Movement, Equity Shares, Indices, ADF, ARCH and GARCH.

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1. Introduction

A stock market (also known as an equity market or share market), is a collection of buyers and sellers of stocks. These stocks represent ownership interests in companies. These may include publicly or privately traded securities. Usually, large companies will list their stock on a stock exchange because it makes their shares more liquid (i.e., easy to buy and sell), which investors find irresistible. This liquidity also attracts international investors. In a long position, the owner benefits when the stock or share gains in value. The potential profit is unlimited. So the "long" position is said to be *"bullish."* When the stock is down, the most that the owner can lose is the amount of money he has originally paid for it. Since it is impossible to lose more, it is said that the owners have "limited liability."

It is an art of trying to determine the future value of the stock market or other financial instrument traded on a stock exchange. The successful stock market prediction will reveal the increase and extra earnings of the share. Generally, the Efficient Market Hypothesis, Fundamental Analysis, Technical Analysis and Internet - based data Sources are used for analyzing the share price movements and prediction of share return.

Stock Exchange makes available stock market indices, which are useful in understanding the level of prices and the trend of the price movements of the market as a whole. Stock markets indices are meant to capture the overall behavior of equity shares. A stock market index is created by selecting a group of stocks that are capable of representing the whole market or a specified sector or segment of the market.

Bombay Stock Exchange came out with a stock index in 1986, which is known as BSE SENSEX. It is an index composed of 30 stocks representing a sample of large, well established financial sound companies selected from different industry groups. The base year of BSE SENSEX is 1978-1979 and the base value is 100.

2. Review of literature

The following are the different studies undertaken in the different period to analysis stock market movement, using different tools which were used for Market movement analysis.

Using Typical Price, Bollinger Bands, Relative Strength Index, Moving Average, Bollinger signal, Chaikin Money Flow Indicator, and Stochastic Momentum Index, Senthamari Kannan. K, Sailapathi Sekar. P, Mohamed Sathik .M and Arumugam .P (2010), in the paper entitled **"Financial Stock Market Forecast using Data Mining Techniques"** analyzed future closing stock price, to predict increase or decrease better than the level of significance. The findings indicated that the algorithm was able to predict the increase or decrease in closing price better than chance (50%) with the high level of significance.

Suresh Kumar K.K and Elango N.M (2011), in the paper entitled **"An Efficient Approach to forecast Indian Stock Market Price and their Performance Analysis"** analyzed prediction of future share prices and their performance, using Gaussian Processes, Isotonic regression, Least Mean Square, Linear Regression, Multilayer perceptron, Pace regression , Simple Liner regression and SMO regression. It was found that isotonic regression functions offer the ability to predict the stock prices more accurately than the other existing techniques.

Using Back Propagation, Naga Bhushana Rao. A and Eswara Rao. K (2014), in the paper entitled **"Estimize Bull speed using Back Propagation"** used computational data mining methodology to predict seven major market indices, using two learning algorithms Linear Regression and Neural networks standard feed forward back propagation. The findings indicated that Backpropagation was a better predictive model to improve forecast accuracy.

P.K Sahoo and Krishna Charlapally (2015), in the paper entitled **"Stock Price Prediction Using Regression Analysis"** predicted the stock prices, using Auto Regressive model. It was found that predicting the return on investment will help in a great way to financial institutions and stock brokers to predict the future price in uncertain conditions.

Using Support Vector Machines, Random forecast, and K – Nearest neighbor, Seyed Enayatolah Alavi, Hasanali Sinaei and Elham Afsharirad (2015), in the paper entitled **"Predict the trend of stock prices using Machine Learning Techniques"** analyzed the movement of stock prices Tejarat Bank of Iran using Machine Learning Techniques and Economic Indicators. The findings indicated that the random forecast classifier, support vector machine, and the K nearest neighbors have the best accuracy in categories.

Jaydip Sen and Tamal Datta Chaudhuri (2016), in the article, **"Decomposition of Time Series Data of Stock Markets and its Implications for Prediction – An Application for Indian Auto Sector"** analyzed the structural analysis to forecast and computed their accuracy in prediction of India Auto sector, during the study period 2010 to 2015, using Neural network, Back Propagation network, ARIMA and Bayesian Autoregressive model. It

was found that the accuracy of our decomposition results and efficiency of forecasting techniques even in presence of a dominant Random component in the time series.

Using R/S Statistic, LO Statistic, Robinson's Estimate, Soumya Guha et al (2016), in the paper entitled **"Investigating the Efficiency of the Indian Currency market: A Persistence Perspective"** measured long-range persistence and its impact on policy decisions in the Indian Forex market during the period 2000 to 2015. The findings indicated that the long memory in volatility and absolute return series of each currency pair were evidence but the logarithmic return series of each currency pairs indicated proclivity towards random walk.

Bhagyashree Nigade , Aishwarya Pawar et al (2017), in the paper entitled "**Stock Trend Prediction Using Regression Analysis – A Data Mining Approach"** analyzed the development and implementation of stock price prediction application using machine learning algorithm and object-oriented approach of software system development, for the period of 1203 days, using regression analysis. The findings indicated that the proposed model uses regression analysis as a data mining techniques and develops a system for exploiting time series data in the financial institution.

In the paper **"An analysis on the Demonetization Effect on Sectorial Indices in India",** by Veerangna Singh (2017), analyzed the demonetization effect on performance and volatility of the sectorial indices India, using paired T- test, Mann- Whitney U Test /Wilcoxon Rank Test, Shapiro – Wilk Test and Beta co- efficient for the period of pre demonetization (7th August to 7th November 2016) and post demonetization period(8th November 2016 to 8th February 2018) for a twelve sectoral indices of NSE namely Auto, Bank, Energy, Financial Services, FMCG, IT, Media, Metal, Pharma, Private Bank, PSU Bank, Reality Index and Nifty 50 Index. It was found that all sectoral indices perform significantly different in pre and post demonetization period except the PSU Bank.

"**ARIMA / GARCH (1,1) Modeling and Forecasting for a GE Stock Price Using R",** by Varun Milk (2017), developed an understanding of the time series analysis, modeling and forecasting performance using ARIMA, GARCH (1,1) and R during the study period 2001 to 2014. It is found that ARIMA and GARCH (1,1) model is applied to observe the forecasting values of low and high stock price in (USD) for GE company.

In the paper **"Volatility Behaviour of Indian Stock Market: A Study with Special Reference To Sectoral Indices of BSE",** by M. Babu & C. Hariharan (2018), investigated the volatility behavior of Indian sectoral indices, using Descriptive statistics, Augmented Dickey Fuller Test and GARCH (1, 1) Model, during the period from January 2012 to December 2016

for a twelve sectoral indices of BSE. It was found that S&P BSE Healthcare and S&P BSE Bankex recorded moderate and high risk, with high return during the study period and investors should watch the market movement before investing their money in stock markets.

3. Research Methodology

The present study considered selected sectoral Indices listed in Bombay Stock Exchange of India ltd to analyze Market movement of Indices using Descriptive Statistics, Augmented Dickey Fuller Test Phillips Perron Test for Stationarity, Normality test using Kolmogorov-Smirnov and Shapiro –Wilk Test, Volatility Test using ARCH and GARCH model during the study period 01st April 2005 to 31st March 2017 for selected sectoral Indices of BSE namely, BSE Fast Moving Consumer Goods, BSE Capital Goods, BSE Consumer Durables and BSE Metal to identify the market movement of indices listed in Bombay Stock Exchange of India Ltd.

3.01 Research Gap

The study is different from earlier studies in the way that Sectoral Indices listed in Bombay Stock Exchange of India Ltd namely; BSE Fast Moving Consumer Goods, BSE Capital Goods, BSE Consumer Durables and BSE Metal were taken into consideration for the present study during the period 01st April 2005 to 31st March 2017.

3.02 Statement of the problem

It is to be noted that the different forms of market movement analysis of Bombay Stock Exchange are used several methods. While analyzing the previous work related to the present study, the following points were noted. M. Babu & C. Hariharan (2018), Varun Milk (2017) Veerangna Singh (2017), Bhagyashree Nigade , Aishwarya Pawar et al (2017), Soumya Guha et al (2016) used various method like Descriptive statistics, Augmented Dickey Fuller Test, ARIMA, GARCH. The results found that model is plied to forecast the values of low, high risk and high return indices of Bombay Stock Exchange.

The studies found that the market movement analysis of Selected Sectoral indices listed in Bombay Stock Exchange. Taking into account, the above analysis, the present study considered the Market Movement Analysis with reference to BSE Sectoral Indices for analyzing the Market movement using Descriptive statistics, Augmented Dickey Fuller Test, Phillips Perron Test for Stationarity, Autocorrelation, Normality test using Kolmogorov-Smirnov and Shapiro –Wilk Test, ARCH and GARCH model during the study period 01st April 2005 to 31st March 2017 of BSE Fast Moving Consumer Goods, BSE Capital Goods,

BSE Consumer Durables and BSE Metal Generally, a change occurs in the price of the stock only because of certain changes in the economy, industry or company. Information about these changes alters the stock prices immediately and stock moves to a new level, either upwards or downwards, depending on the type of information. Therefore, it becomes necessary to evaluate the market movement of returns from time - to - time.

3.03 Need for the Study

The present study is based on the Market movement analysis of selected sample sectoral indices listed in Bombay Stock Exchange of India Ltd. This study will help the investors to assess how the current prices of stock already fully reflect all the information that is contained in the historical sequence of prices. Generally, the Efficient Market Hypothesis, Fundamental Analysis, Technical Analysis and Internet-based data sources are used for analyzing the share price movements and prediction of share return.

Investors in stock exchange need to maximize their profit by buying and selling of securities at an appropriate time. Stock market index nonlinear pattern, so predicting the future prices of the shares is highly difficult.

Forecasting of stock market index gains more attention as the Key factors of investors in the stock market mainly is profitability, if the direction of the stock price is successfully predicted the investors can yield enough profit out of stock market using various stock prediction model.

3.04 Objectives of the study

1. To analyze the normality and stationarity of the daily returns of selected sectoral Indices listed in Bombay Stock Exchange of India ltd.

2. To test the Volatility of the returns of selected sectoral Indices listed in Bombay Stock Exchange of India Ltd.

3. To summarize the findings and suggestions of the study.

3.05 Null Hypothesis of the study

H01: There is no normality in the daily index returns of selected Sectoral Indices listed in Bombay Stock Exchange of India Ltd (BSE).

H02: There is no stationarity in the daily returns of selected Sectoral Indices listed in Bombay Stock Exchange of India Ltd (BSE)

H03: There is no significant Volatility in the selected sample returns

3.06 Methodology of the Study

a) Sample Selection

As on 27th Oct 2017, totally 4 major indices listed in Bombay Stock Exchange of India Ltd, was taken as a sample for the study based on the following conditions:

- ✓ The data availability of the selected sample from 1st April 2005 to 31st March 2017.
- ✓ The data availability of the selected sample with the Open, High, Low and Close price of the daily share returns of the study period.
- ✓ The selected sample returns only from sectoral Indices listed in Bombay Stock Exchange in India BSE Capital Goods, BSE Consumer Durables, BSE Fast Moving Consumer Goods and BSE Metal (for the entire study- specify that is applicable for the selected sectors alone)

3.07 Sources of Data

The data for the present study was collected through secondary data. The daily Index price of selected sectoral Indices listed in Bombay Stock Exchange of India Ltd was taken from the official website BSE (www.bseindia.com and other relevant data were collected from various Books, Journals, and online sources.

3.08 Period of Study

The present study is an attempt to find the market movement analysis of selected Sectoral Indices listed in Bombay Stock Exchange of India Ltd during the study period of 12 years from 1st April 2005 to 31st March 2017.

3.09 Tools used for Analysis

The following statistical tools were used for the analysis of the returns and stock prediction for the selected sample during the study period from 1st April 2005 to 31st March 2017.

Table 3.1 Tools used for Analysis

S.No	Statistical Tools	Meaning
1	Return	To convert the daily closing price of the selected Indices into logarithmic returns
2	Mean	It used to measure for representing the entire data by one value called an average.
3	Standard Deviation	It is a measure of how much "Spread" or "variability" is present in the sample.
4	Skewness	When a distribution is not symmetrical it is called a skewed distribution. It is said to be positive (Mean < Mode) or negative Distribution (mode < mean).
5	Kurtosis	It refers to the degree of flatness or peakedness in the region about the mode of frequency curve.
6	Normality Test (Kolmogorov-Smirnov and Shapiro –Wilk)	A normality test is used to determine whether sample data has been drawn from a normally distributed population (within some tolerance).
7	Stationarity test (using ADF and PP)	If trend persists, prediction is not possible, data convert trend data to stationarity data. In simple trend data convert into times series data.
8	Volatility Test	Volatility refers to the amount of uncertainty or risk about the size of changes in a security's value. A higher volatility means that a security's value can potentially be spread out over a larger range of values. A lower volatility means that a security's value does not fluctuate dramatically, but changes in value at a steady pace over a period of time.

3.10 Limitations of the Study

1. The data for the present study was based only on Secondary source and as such, all the limitations of a secondary source of data applies to the study also.

2. The duration of the study period is restricted to twelve years from 1st April 2005 to
   31st March 2017.

3. While Calculating Descriptive, Normality, Stationarity, and Volatility only Closing Stock Returns of a selected sample are considered.

Table 4.1 Results of Summary Statistics of Sample Indices during the Study period

Measures	Bombay Stock Exchange			
	BSE Capital Goods	BSE Consumer Goods	BSE FMCG	BSE Metal
Mean	-0.999	-0.998	-0.998	-0.999
Maximum	0.000	0.000	0.000	0.000
Minimum	-1.096	-1.116	-1.082	-1.142
Standard Deviation	0.026	0.025	0.022	0.028
Skewness	18.67	19.27	29.23	14.22
Kurtosis	711.23	752.35	1300.17	505.55

Source: Data collected from www.bseindia.com **and computed using E-views.**

Table 4.1 shows the results of Descriptive statistics of BSE Capital Goods, Consumer Goods, FMCG and BSE Metal during the study period 1st April 2005 to 31st March 2017. The Minimum and Maximum values of selected sample ranged between – 1.142 (BSE Metal) to 0.0000 (All the Selected Sectors). The average returns of selected sample were -0.999 which indicates that the investors of selected sectoral Indices earned negative returns during the study period. It is to be noted that the standard deviation value BSE FMCG (0.022), BSE Consuemr Goods (.025), BSE Capital Goods (.026) and BSE Metal (0.028) respectively, which indicates a low volatility. With respect to the data distribution, a positive skewness with a value of least 14.22 (BSE Metal) and Highest BSE FMCG (29.23) was recorded. The Kurtosis which measures, the peakedness of the data distribution was found to be greater than three i.e 1300.17 (BSE FMCG) which indicated Leptokurtic distribution.

Table 4.2 Summary Results of Normality Test using Kolmogorov- Smirnov and Shapiro – Wilk Statistic of Sample Indices during the study period 1st April 2005 to 31st March 2017.

Tests of Normality						
	Kolmogorov-Smirnov			Shapiro-Wilk		
Particulars	Statistic	df	Sig.	Statistic	Df	Sig.
S&P BSE Capital Goods	0.133	2979	<0.001	0.550	2979	<0.001
S&P BSE Consumer Goods	0.138	2979	<0.001	0.533	2979	<0.001
S&P BSE FMCG	0.166	2979	<0.001	0.392	2979	<0.001
S&P BSE METAL	0.113	2979	<0.001	0.625	2979	<0.001

Source: Data Collected from www.bseindia.com **and Computed Using SPSS.**

The results of normality analysis using Kolmogorov-Smirnov and Shapiro-Wilk Test Statistic for S&P BSE Capital Goods, Consumer during the study period 01st April 2005 to 31st March 2017 are presented in **Table 4.2.** It is to be noted that the Kolmogorov-Smirnov Statistic was found to be 0.133, 0.138, 0.166 and 0.113 respectively for the selected sectors and Shapiro-Wilk Statistic was 0.550, 0.533, 0.392, and 0.625 for BSE Capital Goods, BSE Consumer Goods , BSE FMCG and BSE Metal during the study period. With respect to the 'p' value, both statistic recorded statistically significant 'p' value at 5% level. Hence the H01.1: **"There is no normality in the daily index returns of selected sample"** is rejected. Therefore it becomes evident that the selected sectoral Indices listed in BSE witnessed normality of data distribution during the study period.

Table 4.3 Summary Results of Stationarity test using Augmented Dickey Fuller Statistic and Phillips-Perron Statistic of Sample Indices during the study period

1st April 2005 to 31st March 2017.

Stationarity test						
Particulars	**ADF**	**PP**	**1% Level**	**5% Level**	**10% Level**	**Sig.**
S&P BSE Capital Goods	-33.799	-33.712	-3.43236	-2.86231	-2.56723	<0.001
S&P BSE Consumer Goods	-34.661	-35.855	-3.43236	-2.86231	-2.56723	<0.001
S&P BSE FMCG	-30.991	-30.643	-3.43236	-2.86231	-2.56723	<0.001
S&P BSE METAL	-37.229	-37.528	-3.43236	-2.86231	-2.56723	<0.001
*MacKinnon (1996) one-sided p-values.						

Source: Data collected from www.bseindia.com and Computed using E-views

Table 4.3 shows the results of Stationarity test using Augmented Dickey Fuller (ADF) and Phillips – Perron (PP) statistics for S&P BSE Capital Goods, BSE Consumer Goods, BSE FMCG and BSE Metal during the study period 1st April 2005 to 31st March 2017. The Augmented Dickey Filler S&P BSE Capital Goods (33.799), BSE Consumer Goods (34.661), BSE FMCG (30.991) and BSE Metal (37.229) and Phillips Perron S&P BSE Capital Goods (33.712), BSE Consumer Goods (35.855), BSE FMCG(30.643) and BSE Metal (37.528) (Ignoring the Sign) was greater than Test critical values at 1% level (-3.43236), 5% level (-2.86231) and 10% level (-2.56723) for selected returns of S&P BSE Capital Goods, BSE Consumer Goods, BSE FMCG and BSE Metal at level range. Further, the Prob Value was less than 0.05 for the selected sample return of S&P BSE Capital Goods, BSE Consumer Goods, BSE FMCG and BSE Metal (0.000). Hence the **H02: "There is no stationarity in the daily shares price return of Selected Indices"** is rejected. Therefore the S&P BSE

Capital Goods, BSE Consumer Goods, BSE FMCG and BSE Metal confirmed stationarity at level difference.

Table 4.3 Volatility Analysis using GARCH (1,1) Model for Sample Indices 1st April 2005 to 31st March 2017.

Tests of Volatility									
	Mean Equation				Variance Equation				
Particulars	VVar	Coefficient	Std. Error	Z - Statis	Variable	Coefficient	Std. Error	z-Stati	Prob.
BSE Capital Goods	C C	-0.998	0.0004	-2442.8	C	1.27E-06	7.24E-08	17.600	00.00 1
					ARCH(1)	-0.001022	8.17E-05	-12.509	
					GARCH(1)	0.998964	6.92E-05	14440.1	
BSE Consumer Goods	C C	-0.998	0.0004	-2441.1	C	2.02E-06	1.02E-07	19.795	00.00 1
					ARCH(1)	-0.0015	0.00012	-12.390	
					GARCH(1)	0.9978	0.000	9059.0	
BSE FMCG	C C	-0.998	0.0002	-4037.7	C	2.98E-07	4.29E-08	6.940	00.00 1
					ARCH(1)	-0.0008	0.000139	-6.194	
					GARCH(1)	1.0002	5.87E-05	17045.0	
BSE Metal	C C	-0.999	0.0007	-1322.7	C	0.000143	4.36E-05	3.2874	0.001
					ARCH(1)	0.04306	0.012615	3.4134	
					GARCH(1)	0.801382	0.059659	13.432	

Source: Data Collected from www.bseindia.com computed using Eviews.

Table 4.5 presents the results of the mean and variance Equation of GARCH model for BSE Capital Goods, BSE Consumer Goods , BSE FMCG and BSE Metal daily returns from 1st April 2005 to 31st March 2017. It is to be noted that 'C' represent constant. The findings indicates that the mean equation co efficient was negative (-0.999) and significant at 5% level for BSE Capital Goods, BSE Consumer Goods , BSE FMCG and BSE Metal. The variance equation coefficient of ARCH (1) and GARCH (1) of BSE Capital Goods, BSE Consumer Goods , BSE FMCG and BSE Metal returns were close to one (0.999). The coefficient of GARCH is closer to one and ARCH (1) parameter was less than Zero. It is found from the above analysis that the volatility was highly persistent. Hence the **H03:** "**There is no significant Volatility in the selected sample return",** is rejected.

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Page | 27

4. Findings, Suggestions and Conclusion.

5.1 Major Findings of the Study

From the above study it is to be noted that all the selected sectoral indices of BSE Capital Goods, BSE Consumer Goods , BSE FMCG and BSE Metal in Bombay Stock Exchange (BSE) provided negative average returns for the Investors i.e (-0.99). The Standard deviation which measures the variation in the dataset was found to be higher for BSE Capital Goods (0.26) and BSE Metal (0.28) and least value was found for BSE FMCG (0.22). Skewness was found to be positive for all the selected sample returns of sectoral indices, it was found that BSE FMCG recorded highest skewness of 29.23 and least value was found that for BSE Metal (14.22). The Kurtosis which measures the degree of flatness or peakedness of the data distribution was found to be greater than three for BSE FMCG with a value of 1300.17 Similarly, lowest Kurtosis value was noticed in both BSE Metal 505.25

From the results of Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) test of stationarity, it was found that 'P' valued less than 0.05 for Selected indices listed in Bombay stock exchange of which resulted in stationarity at the level difference. It was also found that ADF and PP statistics (Ignoring Sign) was greater than critical values at 1%, 5% and 10% level for all the selected indices at the level range. Therefore BSE Capital Goods, BSE Consumer Goods , BSE FMCG and BSE Metal indices confirmed stationarity at the level difference. The result of Kolmogorov – Smirnov, and Shapiro –Wilk test witnessed 'P' value of less than 0.05 for BSE Capital Goods, BSE Consumer Goods , BSE FMCG and BSE Metal which indicated normality of data distribution. It is noted BSE Capital Goods, BSE Consumer Goods , BSE FMCG and BSE Metal confirmed normality.

The results of GARCH (1,1) which measures the Volatility ($\alpha + \beta$) was found greater than one of the sample indices revealing the persistence of high volatility during the study period. The volatility of selected BSE Sectoral indices reveals that the daily returns were significant at 5% risk level, both in mean and variance Equation for all the selected BSE sectoral indices was found to be Beta and Alpha value were close to one, For S&P BSE Capital Goods 0.998, BSE Consumer Goods (0.998), BSE FMCG (0.998) and BSE Metal (0.999). The volatility of selected BSE Sectoral indices revealed that the daily returns were significant at 5% risk level, both in mean and variance Equation of BSE Capital Goods, BSE Consumer Goods , BSE FMCG and BSE Metal sectoral indices as the Beta and Alpha value were close to one.

Conclusion

The present study made an attempt to find the stock market movement of selected sectoral indices listed in Bombay Stock Exchange of India Ltd and National Stock Exchange of India during the study period of twelve years from 1st April 2005 to 31st March 2017. The present study used different statistical tools, namely Descriptive statistics (Mean, Standard Deviation, Skewness, and Kurtosis), Normality Test (Kolmogorov – Smirnov and Shapiro Wilk test), Stationarity Test (Augmented Dickey-Fuller and Phillip-Perron) and Volatility test ARCH and GARCH Model (Autoregressive Conditional Heteroskedasticity Model and Generalized Autoregressive Conditionally Heteroskedasticity Model).

From the above analysis and Findings, the time series was not close to the expected value, when there is a change in the price the investors can easily identify the risk in the market and time. It is concluded that Information flow determines the intensity of returns for Investors.

Scope for further Study

➢ A study, with similar objectives, could be made with reference to other types of Stock Indices.

➢ A study with similar objectives could be made with reference to Spot, Futures, and Commodity and Derivatives markets.

➢ Artificial Intelligent systems such as Fuzzy Inference system and adaptive Neuro fuzzy inference system can be applied to predict stock market Indices.

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