An Analytical Study of Seasonality Effect in BSE SENSEX

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Abstract—*This research paper seeks to understand the seasonality effect (weekly and monthly) in the Indian stock market. The study is descriptive cum analytical in nature. Secondary data was taken from daily closing prices of BSE SENSEX from 1st April 2005 to 31st March 2015. Descriptive statistics are used to analyze the data. The result of this study exhibit that the average return of BSE SENSEX are not identical, which confirm the presence of weekly and monthly volatility similar the various studies such as Patel and Patel (2011), Nageswari and Selvam (2011), Berument and Kiymaz (2011), Khanna (2014), and Prabhu (2014). The results of the study indicate that BSE SENSEX achieved the highest return on Wednesday (Weekly), and September (Monthly), while the lowest return were recorded on Thursday (Weekly) and February (Monthly) respectively. The paper examines the evidence for the possible existence of the weekly effect and monthly effect in the BSE SENSEX. Thus it is concludes that BSE SENSEX in India are not free from seasonal anomalies despite increased use of advanced information technology and numerous regulatory frameworks.*

Keywords*: Day of the week effect, Month effect, Anomalous behavior and BSE SENSEX*

1. INTRODUCTION

Capital market efficiency has been an important topic for empirical research since long. Now Capital market is the most researched areas in finance among researchers, philosophers and policy makers. The present paper endeavors to identify the existence of market seasonality in the form of return offered by stock markets over the last decade. Seasonality is defined as the repetition of the regular observable behavior/fact in periodical occurrence over a span of less than one year. The presence of seasonality variance in the stock market many factors are responsible such as changes in climate, investor perceptions, tax-loss-selling and information hypothesis on year to year basis. However seasonality variance affects the efficiency of the market hypothesis. The Efficient Market Hypothesis (EMH) examined that an Efficient Market is one where the market price is fully reflects all available information. According to **E. Fama (1970),** "In an efficient market, on an average, competition will cause the full effects of new information on intrinsic value to be reflected instantaneously in actual prices." Further Fama (1970) categorized the market efficiency into three broad categorize

viz. weak form efficiency, semi strong efficiency and strong efficiency. Weak form of efficiency states that all published information reflects in stock prices. Semi-strong form of efficiency denotes that all available information must be reflects into the stock prices. Whereas strong form of efficiency states that all public and private information weather published or not must be reflects the stock prices. However in real life weak and strong form of efficiency do not working. Because in practical life conditions are different, different sources of information and investors have different understanding level and it leads to investors has estimate the different level of stock prices. In this research paper, seasonality effect can be understood as the impact of week of the month and month of a year on the stock price movement. Seasonally effect showed that all the weeks, months and years do not have similar effect on stock price movement. In other words, it may be concluded that some of the week in a month has more effect on the stock price movement than other week in the same month. Similarly in the case of all month's stock price movement does not remain stable.

2. REVIEW OF LITERATURE

Chukwuogor (2007) examined the day of the week effect on stock market return for the ten East-Asian financial market during the post Asian finance crisis. The study was confirmed that insignificant seasonality exists in the most East-Asian market. **Rahman (2009)** found the average returns of Dhaka Stock Exchange (DSE) to be the negative return in the day of Sunday and Monday, while positive return in the day of Thursday. The GARCH model and dummy variable regression show that average daily return were statistically different in every working day. **Nageswari and Selvan (2011)** analyzed a seasonal effect in the Indian stock market by using daily return on Bombay Stock Exchange. The study found that highest mean return record on Wednesday and lowest mean return Monday during the study period (April 2000 to march 2010). In case of monthly return exposed that there was a positive mean return on November and negative mean return on October. It was inferred that the day of the monthly pattern did not exist in Bombay stock market during the study period. **Patel and Patel (2011)** investigated the day of the week

effect, return volatility and annual return of Bombay Stock Exchange during the period (2001-10). The study found that there was no significant volatility seasonality in the day of the week. Parametric and non-parametric tests were used to check the equality of mean return and standard deviation of the return across the days of the week. **Faryad et al. (2011)** explored the week effect in the Pakistani stock market. The data was collected from daily mean return of KSE-100 SENSEX for the period (2006-10). The study found that mean return on Tuesday was more volatile over other days of the week. **Poornima and Chitra (2013)** exposed that there was a positive mean return record on Friday and negative mean return record on Monday during the study period (April 2004 to March 2012). The study indicated that Friday effect exist in the Indian stock market during the study period and found that any new positive information boost up the market. **Prabhu (2014)** using the data from the time period February 2006 to February 2014 and concluded that the stock return are low on Monday and first half of the month. **Shri ram and Ramesh (2014)** examined the presence of seasonality in the Indian stock market during (March 2003 to April 2014). The study found that stock returns of Nifty junior were more volatile as compared to the CNX Nifty. It was discovered that no seasonality exist in both indices CNX Nifty (except January month) and Nifty junior at the 5% level of significance. Dummy variable techniques used to check the seasonality exist in the Indian stock market.

3. RESEARCH DESIGN

3.1. Objectives of the Study

The specific objectives of the present study are as follows:-

- To test the presence of day of the weekly effect in the returns of Bombay Stock Exchange.

- To examine the seasonality in monthly returns of Bombay Stock Exchange.

3.2. Hypothesis of the Study

H01: There is no significant difference in returns of BSE SENSEX across the days of the week.

H02: There is no significant difference in the returns of BSE SENSEX across the months of the year.

4. RESEARCH METHODOLOGY OF THE STUDY

A. Variables for the study

In order to achieve the objective of the study closing prices of BSE SENSEX has been taken to study the stock market behavior in India. The Bombay Stock Exchange (BSE) is the first and largest best performance indicator of the whole economy in India, which was established in 1875 as the Native Share and Stock Brokers' Association.

B. Data Sources: The present study is based on the secondary data, which has been collected from the daily closing price of BSE SENSEX.

C. Study Period:

The required information for the present study were the daily closing prices of BSE SENSEX and covered a period of ten years from 1st April 2005 to 31st March 2015 and which in consider total 2485 observations, excluding Official holidays. The Bombay Stock Exchange operates from Monday to Friday, while Saturday and Sunday are the official weekend in which no transaction takes place.

D. Analytical Tools and Techniques

This is a descriptive cum analytical study in nature**.** Mean, Standard Deviation, Skewness and Kurtosis have been used in the present study and drawing conclusion.

D. (1). Return

To compute the return for each trading day the following formula was used:

Rt=In (lt/lt-1)*100

Wherein:

Rt- Return of each trading day in the index

In- Natural log of underlying market series

Lt- Closing value of the given index (l) on a specific trading day

Lt-1- Closing value of the given index (l) on a preceding trading day

5.1. Analysis of Stock Market Seasonality

(1)   The following area presence the analysis about the week returns of BSE SENSEX.

Table.1

Descriptive Statistics in Trading Day of the Week (1 April, 2005 - 31st March, 2015)

Sources: BSE

Table: 1 indicates that the highest daily mean return of BSE was 0.1279 on Wednesday. The lowest mean return was found 0.0255 Thursday for BSE. The standard deviation showed the variability in the data. The highest standard deviation was recorded for BSE 1.8301 on Monday as compare to other trading days. It may be concluded that return of BSE was more volatile on Monday during the study period. The presence of volatility and lowest return in the BSE SENSEX on Monday is that usually the most unfavorable news coming during the weekends (Bhattacharya et al. 2012).

4.2. (2) The following area presence the analysis about the monthly return of BSE SENSEX.

Table.3

Results of descriptive statistics in trading day of the month from 1 April 2005 to 31st March 2015

		BSE		
Variables	**Mean**	**Std. Deviation**	**Skewness**	**Kurtosis**
January	-0.0378	1.59099	-0.509	5.390
February	-0.0482	1.34223	-0.373	1.705
March	0.1122	1.60676	-0.347	2.983
April	0.1837	1.32824	-0.123	1.204
May	0.0826	1.88889	3.458	33.041
June	0.0368	1.58930	0.206	2.251
July	0.1284	1.58686	0.018	2.570
August	0.0212	1.32699	-0.413	1.159
September	0.2317	1.37362	-0.098	2.102
October	-0.0127	2.06772	-0.484	6.265
November	0.0443	1.58887	0.077	3.359
December	0.1033	1.31669	0.488	2.540

Sources: BSE

Weekly	**N**	**Mean**	**Std. Deviation**	**Skewness**	**Kurtosis**
Monday	497	0.0721	1.83010	1.400	17.371
Tuesday	498	0.0428	1.40695	-0.021	3.183
Wednesday	494	0.1279	1.46145	-0.063	3.556
Thursday	489	0.0255	1.44164	-0.124	3.117
Friday	490	0.0761	1.68085	-0.311	5.920

Table: 2 indicate the maximum positive monthly mean return was found 0.2317 on September for BSE SENSEX. The highest negatively mean return were found -.0378, -0.0482 and -0.0127 in the month of January, February, June and October. The main reason behind negative return is that in these months income tax accessed and paid. Hence stakeholders sell their securities in these months to settle their tax dues.

5. FINDINGS AND SUGGESTIONS:

The present paper analyzes the volatility in the BSE SENSEX. During analysis the followings important point are founds and on the basis of these finding to give the suggestion:

The result explored that BSE SENSEX record the highest mean return on Wednesday and lowest mean return were record on Thursday. So, it is advised that an investor purchase the shares on Thursday and sell their share on Wednesday. Thus an investor could earn maximum return. The study also indicate that the highest value of standard deviation was found on Monday and least value of standard deviation on Tuesday. Which indicate that during the study period BSE SENSEX was more volatile on Monday as compared to the other trading days (Tuesday, Wednesday, Thursday and Friday) of the week. Further, it is to be pointed that BSE SENSEX showed positive skewed for the day of Monday and negative skewed on remaining trading days of the week. The study also found that during the study period, the peak of return distribution was leptokurtic kurtosis for all the days of the week and highest (17.371) for the day of Monday.

According to the monthly wise analysis the study found that there was a negative mean return found for the months of January, February and October and positive return were found on remaining months of the year. But, the highest (0.1837) being on April. So, it is advised that if new investors invest their money in securities, than it is the best time period (during the Jan, Feb and Oct months) for him. The study also indicate that the highest value of standard deviation was found on October and lowest value of standard deviation on December. Which indicate that, during the study period BSE SENSEX was more volatile on October as compared to the other months of the year. Further, it is to be noted that BSE SENSEX showed highest skewed for the month of May and lowest skewed on January. The study also found that during the study period, the peak of return distribution was leptokurtic kurtosis for all the months of the year and highest (33.041) for the month of May.

6. LIMITATION

Results of this study depend on the stock market movement. If the stock market is doing well, results may suggest that it's right time to invest. If the stock market is not doing well, results may suggest that the market is inefficient (e.g. presence of a market anomaly such as the day-of-the-week effect and monthly effect).

7. CONCLUSION

This paper examined the volatility on BSE SENSEX return. The study investigates the day of week effect and monthly effect in BSE SENSEX during the period 1st April 2005 to 31st March 2015. The result of this study exhibit that the average return of BSE SENSEX are not identical, which confirm the presence of weekly and monthly volatility similar the various studies such as Patel and Patel (2011), Nageswari and Selvam (2011), Berument and Kiymaz (2011), Khanna (2014), and Prabhu (2014). The study explored that highest weekly mean return in BSE indices on Wednesday. The study also explored that an investor should be sell their share in the month of September because at this time share market achieve the maximum growth and a shareholder earn the high return. Finally, the result of this paper not beneficial only for financial manager and existing shareholder, but also useful for new investors which invest their money first time and help them to make appropriate investment strategic.

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