

Stability of the day of the week effect in return and in volatility: evidence from Bombay stock market

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Abstract

Day of the week effect is one of the vital calendar irregularities that have been experiential in many stock markets in all over the world with a lot of unlike consequences. Stock markets are theoretical market, thus, investors are more worried about which day is the excellent for the trade. The main objective of this paper is to trace out the suitable day of the week consequence in the developing stock market of a emerging country like India for the period 1st January 2000 to 31st December 2014. So as to justify the objectives of the paper the daily returns data of four main indices of Bombay Stock Exchange have categorized focused on the day-of-the-week-Monday through Friday. For testing the uniformity of mean returns of the day the various parametric tests like Mean, Standard deviation, Skewness and Kurtosis have been adopted to study the volatility pattern of the daily returns with the intent of find out the day of the week effect. Although index displays Wednesday return on inter-day return of the index, Monday provides lowest return with higher volatility.

Keywords: Stock Exchange, Indian Stock Market, BSE, Market risk factors, Indices, Day-of-the-week effects, Intraday effects.

Introduction

Capital markets provide histrionic activities, besides stock prices appear too volatile to be defendable by fluctuations in fundamentals. Investors cause in fluctuation of each stock prices as they decide the important of each stock. Fundamentally, share prices fluctuate due of supply and demand. When more people decide to purchase a stock than the price goes up. Contrariwise, if more people decide to sell a stock, then there would be additional supply and demand comes down and the price begins to decrease.

Volatility in the stock return is an important fragment of stock market through the irregularities in bull and bear scenario. In the bullish market, the share prices fly high then in the bearish market share prices come down. These upwards and downwards movement determine the return as well as volatility of the stock market. Volatility is an indication of an extremely liquid stock exchange.

Pricing of various financial securities use to depend upon the volatility of each security. An increase in stock market volatility raises a large stock price fluctuation of ups or downs. Investors understand an increase in prices at stock market volatility by way of an increase in the risk of securities investment and subsequently they change their investments approach to fewer risky financial securities. It has an impression on business investment that the economic development decided several of channels. Variations in domestics or foreign economic as well as political situations effect the share price movement and demonstrate the situation of stock market to the general public. Therefore the issues of return and volatility have become increasingly important in recent times to the Indian investors, regulators, brokers, policy makers, dealers and researchers with the growth in the FIIs investment.

Literature Review

Bayar and Kan (2002) considering 19 countries data from July 20, 1993 to July 1, 1998 investigated the daily returns then found that the stock prices return differ for currency and dollar denominated returns, the latter being showing lesser daily means in addition to greater standard deviations associated to the previous. In currency trading shows greater returns during the middle of the week and lesser returns at the end of the week. Aly Mehdian and Perry (2004) investigated the day of the week effect in the Capital Market Authority (CMA) Index of Egypt. This study covers the period from 1998 to 2001. Nevertheless, the research considers Multiple Linear Regression Model incorporating dummy variables. The Monday return has analyses along the weeks of the month. The consequences accomplish that the Monday return is positive and statistically important. The other days of the week have unimportant impact on the average return. Furthermore, the Monday return is meaningfully more volatile than the other days of the week.

Basher and Sadorsky (2006) investigated the days of the week effect in world's twenty one emerging stock exchanges. This study is for the period from 31 December 1992 to 31 October 2003. Though, five models are been projected so as to achieve the objectives. The market risk factor has also combined separately with the dummy variables with the purpose of achieve the aims. But, various models provide dissimilar consequences then the overall day of the week effect is exist in Philippines, Pakistan and Taiwan even after regulating for market risk. Tevdovski, Mihajlov & Sazdovski (2012) investigated the day of the week effect on selected stock markets of South Eastern Europe. This study was related from 2006 to

2011. Though, this study instigates through a multiple regression analysis integrating Dummy variables. This research speaks that the average return on Monday is negative lesser than that of other days of the week. Nevertheless, none of the days of the week is statistically momentous in amplification difference in average return.

Rodriguez (2012) investigated the days of the week effect on return and volatilities in six main stock exchanges of Latin America cover the period from 1993 to 2007. With the intention of finding out the belongings of days of the week on average return a Multiple Linear Regression Model projected including dummy variables then lagged value of the return. Furthermore, the day of the week effect on the conditional variance analyzed by approximating a MLRM including dummy variables. This results provide that the effect in volatilities is higher recurrent than the return. However, volatilities are higher on Monday return than on any other days of the week. Further, the weekend result is predominant in the Latin American Stock Markets.

Empirical results have been shown that on Monday the market has been statistically important negative return though on Friday’s statistically important positive returns. The most acceptable clarification that has assumed for negative return on Mondays in that typically the greatest critical news seems during the weekends. There critical news affects the conventional of the investors negatively, instigating them to sell on the subsequent Monday. The greatest acceptable clarification that has been assumed for Tuesday’s negative returns are that the bad news of the weekend, effect negatively lagged by one day. If seasonality exists in the market the investors can take benefit of the same as well as regulate their trading approaches therefore to upsurge their revenues with timing the market.

Some of the more specific points are

1. Accept or refuse the presence of the “seasonality” in Bombay stock exchange.
2. Projecting past pattern into the future by examining the past pattern the investor can predict short range future and can reap good return by using the pattern.
3. For hedging against risk and for portfolio management, reliable volatility estimates are crucial.

The main importance of this study is present the day of the week effect on the Indian stock market in the

present-day. The foremost irregularity carried out was the calendar-related nonstandard rates of return. This study has observed the patterns of the valuable in judgment the contracts thus exploring the occasion of misusing symmetries in the stock market return. This study efforts to discover the conceivable occurrence of weekly “day of the week effect” of Bombay stock exchange by using the daily mean returns on different indices.

Objective of the study

1. To explore the day-of-the-week effect on the Bombay stock exchange returns in the present era.
2. To find out whether there is a presence of opportunity to make consistent abnormal returns through a trading strategy of buying on Monday & selling on Friday.

Research Methodology

In the study it has examined to find out the day of the week pattern in the four different Stock Market Indices namely the Bombay Sensitivity Index (Sensdex), the BSE 100, the BSE 200 and the BSE 500. The data for the study is related to a period of 15 years which is since January 2, 2000 to December 31, 2014

Following formula will be used to calculate the return.

$$R_t = \ln [I_t / I_{t-1}]$$

Where R_t – Return on day t .

I_t = Index value on day ‘ t ’

I_{t-1} = Index value on day “ $t-1$ ”

And \ln = Natural log.

The different parametric tests like Mean, Stand deviation, Skewness and Kurtosis to study the distribution pattern of the daily returns along the week to the return series in order to measure the day of the week analysis.

Analysis day of the week effect in Bombay stock exchange

As mentioned earlier the study includes the study of four indices viz., the Sensdex, the BSE 100, the BSE 200 and the BSE 500.

The day of the week effect in Sensdex: BSE Sensdex is one of the greatest extensively used indices representing the price movement of the Indian stock market. Sensdex is also called the BSE 30. So we have tested the day of the week pattern of the Sensdex, by applying the parametric test whose results are depicted in the Table 1.

Table 1: Sensdex- Day of the Week Effect

| Particulars | Monday | Tuesday | Wednesday | Thursday | Friday |
|--------------------|--------|---------|-----------|----------|---------|
| Mean | 0.0081 | 0.0072 | 0.1463 | 0.0177 | 0.0411 |
| Standard Deviation | 2.2326 | 1.4629 | 1.6262 | 1.6831 | 1.8021 |
| Kurtosis | 5.4001 | 3.3111 | 1.8102 | 1.4444 | 3.8889 |
| Skewness | 0.0424 | -0.3001 | 0.1633 | -0.0139 | -0.3201 |

Source: Results obtained from SPSS package for statistical analysis

It is observed from the Table 1 that the mean returns for Tuesday is the lowest (0.0072) whereas the Wednesday average return is observed highest (0.1463). Standard deviation measures the volatility of the stock market found highest (2.2326) on Monday but it is lowest (1.4629) on Tuesday. The return distributions are positively skewed on Monday and Wednesday. And all other days it is negatively skewed. The Wednesdays return distribution (0.1633) is more skewed than from the other days. The return distributions are observed to be more peaked on Monday, Tuesday and Friday.

The day of the week effect in BSE 100: The results of intra-week seasonality pattern for the BSE 100 have been elaborated in the Table 2.

Table 2: BSE 100 - Day of the Week Effect

| Particulars | Monday | Tuesday | Wednesday | Thursday | Friday |
|--------------------|---------|---------|-----------|----------|---------|
| Mean | 0.0981 | -0.0114 | 0.1258 | 0.0242 | -0.0066 |
| Standard Deviation | 2.0660 | 1.7696 | 1.6372 | 1.5698 | 1.7971 |
| Kurtosis | 6.5422 | 4.3682 | 2.3661 | 2.2857 | 4.2871 |
| Skewness | -0.1889 | -0.4145 | 0.0488 | -0.1945 | -0.6542 |

Source: Results obtained from SPSS package for statistical analysis

It has depicted from the Table 2 that the mean returns for Tuesday and Friday is negative. The mean return is lowest on Tuesday (-0.0114), whereas the mean return of Wednesday is the highest (0.1258). Standard deviation is highest (2.0660) for the Monday and the lowest (1.5698) for the Thursday. The return distributions are positively skewed on Wednesday. But then in other days it is negatively skewed. The Wednesdays return distribution is more skewed and that for the Friday is the least skewed. The return distributions are leptokurtic in nature on Monday, Tuesday and Friday, the value being highest for Monday (6.5422).

The day of the week effect in BSE 200: The results of intra-week seasonality pattern for the BSE 200 have been shown in the Table 3.

Table 3: BSE 200 - Day of the Week Effect

| Particulars | Monday | Tuesday | Wednesday | Thursday | Friday |
|--------------------|---------|---------|-----------|----------|---------|
| Mean | 0.0991 | -0.0201 | 0.1466 | 0.0103 | -0.0178 |
| Standard Deviation | 2.1501 | 1.6211 | 1.5899 | 1.4999 | 1.7801 |
| Kurtosis | 6.9000 | 3.9161 | 2.1193 | 2.1913 | 4.6111 |
| Skewness | -0.3111 | -0.3722 | 0.0832 | -0.1888 | -0.8113 |

Source: Results obtained from SPSS package for statistical analysis

It is found from the Table 3 that the mean returns for Tuesday and Friday are negative. The mean return for the Tuesday is the lowest (-0.0201), and the mean return of Wednesday is the highest (0.1466). The standard deviation is highest (2.1501) for the Monday, on the other hand lowest for the Thursday (1.4999), which indicates that the volatility is highest on Monday but lowest on Thursday. The return distributions are positively skewed on Wednesday, then all other days it is negatively skewed. The Wednesdays return distribution is more skewed and that for the Friday is the least skewed. The return distributions are found to be leptokurtic on Monday, Tuesday and Friday, the value being highest for Monday (6.9000).

The day of the week effect in BSE 500: The results of intra week seasonality pattern for the BSE 500 have been given in the Table 4.

Table 4: BSE 500 - Day of the Week Effect

| Particulars | Monday | Tuesday | Wednesday | Thursday | Friday |
|--------------------|---------|---------|-----------|----------|---------|
| Mean | 0.0990 | 0.0142 | 0.1311 | 0.0300 | 0.0201 |
| Standard Deviation | 2.2211 | 1.7678 | 1.6755 | 1.6001 | 1.9223 |
| Kurtosis | 7.5120 | 3.8092 | 2.1009 | 2.4738 | 4.5212 |
| Skewness | -0.4011 | -0.4581 | -0.1982 | -0.4991 | -0.9500 |

Source: Results obtained from SPSS package for statistical analysis

It is observed from the Table 4 that the mean returns for Tuesday is the lowest (0.0142), while the mean return of Wednesday is the highest (0.1311). Standard deviation as a measure of volatility is found to be the highest (2.2211) for the Monday, whereas the lowest for the Thursday (1.6001). The return distributions are negatively skewed in all the days. The Wednesday return distribution is more negatively skewed and that for the Friday is the least skewed. The return distributions are found to be leptokurtic on Monday, Tuesday and Friday, the value being highest for Monday (7.5120).

Table 5: Comparative Study of the Indices for Day of the Week Effect

| Indices | Minimum Returns | Maximum Returns | Minimum S.D | Maximum S.D |
|---------|-----------------|-----------------|-------------|-------------|
| Sensex | Tuesday | Wednesday | Tuesday | Monday |
| BSE 100 | Tuesday | Wednesday | Thursday | Monday |
| BSE 200 | Tuesday | Wednesday | Thursday | Monday |
| BSE 500 | Tuesday | Wednesday | Thursday | Monday |

Source: Results obtained from SPSS package for statistical analysis

The results presented in the Table V highlighted that, all the four Indices have same results regarding the minimum and maximum returns. So the seasonality pattern exists among the days in a week. We found that Wednesday exhibits the highest mean return, and Tuesday has lowest mean return. And the standard deviation is highest on Monday in all Indices. But Tuesday and Thursday are giving lowest standard deviation. So it indicates the volatility is more on Monday.

Analysis of BETA: Beta is the measure the market risk. The table 6 displays that beta and its rank of days of the week returns. Beta of Monday found to be highest and while beta recorded lowest in Thursday. Therefore market risk is uppermost on the investment in Monday and minimum investment in Thursday.

Table 6: Beta Coefficient of Day of the Week Returns

| Index | Sensex | | BSE 100 | | BSE 200 | | BSE 500 | |
|-----------|--------|------|---------|------|---------|------|---------|------|
| | BETA | Rank | BETA | Rank | BETA | Rank | BETA | Rank |
| Monday | 0.1989 | 1 | 0.1915 | 1 | 0.1912 | 1 | 0.2813 | 1 |
| Tuesday | 0.0165 | 5 | 0.1089 | 4 | 0.1226 | 3 | 0.2734 | 2 |
| Wednesday | 0.1408 | 2 | 0.1513 | 3 | 0.1184 | 4 | 0.2091 | 3 |
| Thursday | 0.1124 | 4 | 0.1051 | 5 | 0.1014 | 5 | 0.0376 | 5 |
| Friday | 0.1584 | 3 | 0.1774 | 2 | 0.1624 | 2 | 0.0429 | 4 |

Analysis of Return per Volatility: Table 7 demonstrates the ranking of day of the week returns according to return per volatility measured in terms of beta. Wednesday return ranks higher as compare to other in the case of return per volatility and Tuesday return has positioned at backseat, which designates that if investors have to select among different days then Wednesday has performed better than that of other days throughout the study period.

Table 7: Return per Volatility of Day of the Week Returns

| Index | Sensex | | BSE 100 | | BSE 200 | | BSE 500 | |
|-----------|---------------|------|---------------|------|---------------|------|---------------|------|
| | Return / BETA | Rank | Return / BETA | Rank | Return / BETA | Rank | Return / BETA | Rank |
| Monday | 0.0407 | 5 | 0.5123 | 2 | 0.5183 | 2 | 0.0290 | 2 |
| Tuesday | 0.4364 | 2 | -0.1047 | 5 | -0.1639 | 5 | 0.0047 | 5 |
| Wednesday | 1.0391 | 1 | 0.8315 | 1 | 1.2382 | 1 | 0.0328 | 1 |
| Thursday | 0.1575 | 4 | 0.2303 | 3 | 0.1016 | 3 | 0.0060 | 4 |
| Friday | 0.2595 | 3 | -0.0372 | 4 | -0.1096 | 4 | 0.0101 | 3 |

Analysis of Return per Standard Deviation: Table 5 indicates the position of different day of the week returns with the relation to standard deviation (SD). Here it can observe that Wednesday has performed better (less risky), than other days throughout the study period, whereas Tuesday has to avoid in the measure of return per standard deviation for reducing the risk.

Table 8: Return per Standard Deviation of Day of the Week Returns

| Index | Sensex | | BSE 100 | | BSE 200 | | BSE 500 | |
|-----------|-------------|------|-------------|------|-------------|------|-------------|------|
| | Return / SD | Rank | Return / SD | Rank | Return / SD | Rank | Return / SD | Rank |
| Monday | 0.0036 | 5 | 0.0475 | 2 | 0.0461 | 2 | 0.0446 | 2 |
| Tuesday | 0.0049 | 4 | -0.0064 | 5 | -0.0124 | 5 | 0.0080 | 5 |
| Wednesday | 0.0900 | 1 | 0.0768 | 1 | 0.0922 | 1 | 0.0782 | 1 |
| Thursday | 0.0105 | 3 | 0.0154 | 3 | 0.0069 | 3 | 0.0187 | 3 |
| Friday | 0.0228 | 2 | -0.0037 | 4 | -0.0100 | 4 | 0.0105 | 4 |

Conclusion

This paper investigates empirically the day-of-the-week effect on stock returns and volatility of the Indian stock markets mainly evidence from Bombay Stock Market. In this study it has examined that the day of the week effect for four indices viz. Bombay Sensitivity Index (Sensex), the BSE 100, the BSE 200 and the BSE 500 over the period of January 2000 to December 2014. It has found that all the four Indices have same results regarding the minimum as well as maximum returns. Wednesday exhibits the highest mean return, and Tuesday has lowest mean return. And the standard deviation is highest on Monday in all Indices. But Tuesday and Thursday are giving lowest standard deviation. So it indicates the volatility is more on Monday. In the analysis of beta, which is the measure of market risk found to be highest for Monday and while beta recorded lowest in Thursday. Therefore market risk is uppermost on the investment in Monday and minimum investment in Thursday.

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