

The October Effect on BSE Index

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October month is well-known for fluctuations in Indian capital markets. The author studies the October anomaly on BSE index.

The study examines the October Effect in the emerging Indian stock market. Increasing interest of investors in emerging market has motivated a great deal of research aimed at understanding the risk and return characteristics of stock prices in every month, especially in the month of October.

October has traditionally been a scary month for stock markets. Remember the October 2005 when the sensex fell from a high of 8,821 (reached on 5) to a low of 7,656 on the 28, a fall of 13.2% in a little over three weeks. It is not just that year's traumatic experience that makes the market players nervous about October. The month has been associated with some of the worst crashes in market history.

A historical analysis has found that despite October's reputation for market falls, September is the month most prone to crashing. The analysis found that October has recorded an average index drop of 0.25% over the last 22 Septembers in FTSE 100.

October's bad reputation may be well deserved in the Indian market. Despite being the month in which Diwali is usually celebrated markets have not done well during October. In the past 17 Octobers between 1991 and 2007 the market has gone up just six times, it has been flat once and fallen on 10 occasions.

A collection of theories shows us that certain days, months or times of year are subject to above-average price changes in market indexes and can, therefore, represent good or bad times to invest. Some theories that fall under the calendar effect include the Monday effect, the October effect, the Halloween effect and the January effect.

Some people believe that stock prices generally increase during the month of January, because people are buying back stocks after end of the year sell-off by

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investors harvesting tax losses, this is known as January effect. This effect is often seen in the US, but in India this effect is observed in the month of April and in October, so it is known as October effect.

Literature Survey

Seasonal anomalies or calendar effects in securities markets have been much discussed among academics and practitioners. Major seasonality documented in the literature of this field are month of the year effects, day of the week effects, turn of the month effects, turn of the year effects, holiday effects and January effect. A major finding in most of the empirical research on monthly seasonality in stock markets is the so-called January effect concerning abnormal returns during this month compared to the rest of the year.

Over six decades ago, Wachtel (1942) described January Effect on Stock prices. Wachtel who first described January Effect in financial markets, found that the Dow-Jones industrial Average from 1927 – 942 showed frequent bullish tendencies from December to January.

Rozeff and Kinney (1976) found that average return on equal-weighted index of New York Stock Exchange prices 1905 through 1974 was 3.5% during January and only 0.5% during other months. Banz (1981) showed that small firms had higher expected returns and Keim (1983) found that nearly half of the excess returns of small firms occurred during January. Moreover, half of the January returns came during the first five days of the month, specially the first day of trading.

Guitekin and Gultekin (1983) documented evidence of seasonality, mainly January effect, in stock returns in 13 of 17 countries studied. Their studies are particularly strong given that they used value weighted indices that give less weight to small firms, which drive the January Effect in the US data. Berges, McConnell, and Schlarbaum (1984) noted that Canada did not introduce Capital Gains Tax before 1973, but a January Effect existed there both before and after the introduction of tax. Kato and Schallheim (1985) found that although there is no tax on Capital gains for investors in Japan nor a tax benefit for losses, there is a strong January Effect in the country.

Not only that various studies have suggested that the January effect may arise from the prevalence of end-of-year 'window dressing' by professional investors seeking to eliminate embarrassing losers from their portfolios prior to the end of important reporting periods. For example, Lakonishok, Shleifer, Thaler, and Vishny (1991) argued that portfolio returns are noisy, so sponsors examine individual portfolio holdings to gain additional perspective on an investment Manager's investment philosophy and execution. According to this, window-dressing hypothesis, institutional investors are evaluated on both their investment results and the consistency of their investment philosophy. At the end of the calendar year or any important reporting period, institutional investors may be prone to sell losers and buy winners to improve perceived performance. A reasonable assumption, however, is that window dressing by large institutional investors, if present, would be a large-cap phenomenon. So, the window dressing hypothesis may have limited relevance for explaining the January effect if the effect is restricted to small-cap stocks.

All these studies show that there is a January effect in the western countries which shows that there is a tendency of the stock market to rise between December 31 and the

end of the first week in January. The January effect occurs because many investors choose to sell some of their stock right before the end of the year in order to claim a capital loss for tax purposes. Similarly, in India there is what we say is the October effect as this time is considered as the time of festivals for the Indians.

October effect is a theory that postulates that the stocks will tend to decline in the month of October. Although historically there has been a slight underperformance in October which most observers attribute to chance, the psychological effects of a few serious market crashes in October have kept the perception alive. Some investors may be nervous during October since the dates of some large historical market crashes occurred during this month. Black Monday, Tuesday and Thursday all occurred in October 1929, after which came the Great Depression. In addition, the great crash of 1987 occurred on October 19, and saw the Dow plummet 22.6% in a single day.

Relevance surveys were made on Indian stock market to see the day of the week effect on BSE during 1988-1990. Poshakwale (1996) studied the returns on BSE between 1987-1994 and found that mean returns expect for Monday and Wednesday are positive and that week end effect on returns support the presence of first order auto correlation and provide indication of non random nature of stock price on BSE. Like wise monthly effect has played a significant role in the Indian Stock Market. A recent study by Nath and Dalvi (2005) find that before the introduction of rolling settlement, this effect was significant. But after the introduction, this type of effect shows market inefficiencies.

Another interesting anomaly is the so-called Mark Twain Effect which concerns that average returns during the month of October are significantly lower than those in the rest of the year. According to quotation from Cadsby (1989), Twain (1981), in his classic novel, writes, "October: This is one of the peculiarly dangerous months to speculate in stocks in. The others are July, January, September, April, November, May, March, June, December, August, and February." Cadsby (1989) provides evidence in the support of the Mark Twain Effect in Canadian stock market.

Data and Methodology

Objective

The objective of the study is to find out the October effect in the Indian stock Market, i.e., BSE Sensex and to observe how the market behaved during the month of October for the last five years, i.e., 2002 to 2007.

Scope of the Study

The study has been done on BSE 30, taking the opening index of each month. The study has been done for the period of five years, i.e., from 2002 to 2007.

Research Methodology

- The BSE index at the beginning of the month was arranged from January to December.
- The process was repeated for five years, i.e., from 2002 to 2007.
- The data was divided into four quarters:

Quarter 1 – January to March.

Quarter 2 – April to June.

Quarter 3 – July to September

Quarter 4 – October to December.

- The Index was arranged in ascending order for each quarter.
- Quartile Deviation was calculated using the following formula:

$$\frac{Q_3 - Q_1}{2}$$

Where, $Q_1 = (N+1)/4^{\text{th}}$ Item

$Q_3 = 3(N+1/4)^{\text{th}}$ Item

- Index is divided into two equal halves, i.e., from January to June and July to December.
- Mean Deviation for each period is calculated using the following formula:

$$\text{Mean Deviation} = \frac{\sum D}{N}$$

$$D = |\bar{X} - X|$$

- Standard Deviation of each year is calculated by the formula:

$$\sigma = \sqrt{\frac{\sum d^2}{N} - \left(\frac{\sum d}{N}\right)^2}$$

$$D = |X - \bar{X}|$$

- t-distribution for each quarter is calculated by the formula:
(Total Mean – Quartile Mean)/Standard Deviation
- Run test is applied by using the following formula:

$$\mu_r = \frac{2n_1n_2}{n_1 + n_2} + 1$$

And,

$$\sigma_r = \sqrt{\frac{2n_1n_2(2n_1n_2 - n_1 - n_2)}{(n_1 + n_2)^2(n_1 + n_2 - 1)}}$$

Total number of runs – n

Number of runs – r

Number of +ve price changes – n_1

Number of -ve price changes – n_2

Hypothesis

Null Hypothesis: H_0 = There is no October Effect on BSE index.

Alternate Hypothesis: H_1 = There is October Effect on BSE index.

Source of Data

The study comprises secondary data and some are computed. The secondary data has been taken from Internet and computed data is derived from the historical data. Data has all been taken for research purpose, adhering to ethical norms and regulations.

Sample Design

The standard BSE Sensex has been used for the calculations for the period 2002-2007.

Limitation of Study

The study which has been for a period of five years, i.e., from 2002 to 2007 is a limitation for the study. If the period would have been more, the results could have been more accurate.

Findings

Categorizing the BSE index into four quarters makes it easier to study the October effect. By comparing the quartile deviation, mean deviation and standard deviation and thereafter by applying t-test helps study the October effect. Table 1 shows the index value at the beginning of the month. The index has been represented in Graph 1.

	2003	2004	2005	2006	2007
Jan	3250.38	5695.67	6555.94	9919.89	14090.92
Feb	3283.66	5667.51	6713.86	10370.24	12938.09
Mar	3048.72	5590.60	6492.82	11279.96	13072.10
Apr	2959.79	5655.09	6154.44	11851.93	13872.37
May	3180.75	4759.62	6715.11	10398.61	14544.46
Jun	3607.13	4795.46	7193.85	10609.25	14650.51
Jul	3792.61	5170.32	7635.42	10743.88	15550.99
Aug	4244.73	5192.08	7805.43	11699.05	15318.6
Sep	4453.24	5583.61	8634.48	12454.42	17291.1
Oct	4906.87	5672.27	7892.32	12961.90	19837.99
Nov	5044.82	6234.29	8788.81	13696.31	19363.19
Dec	5838.96	6602.69	9397.93	13786.91	20375.87

Source: finance.yahoo.com

Graph 1: Index Graph for the Study Period

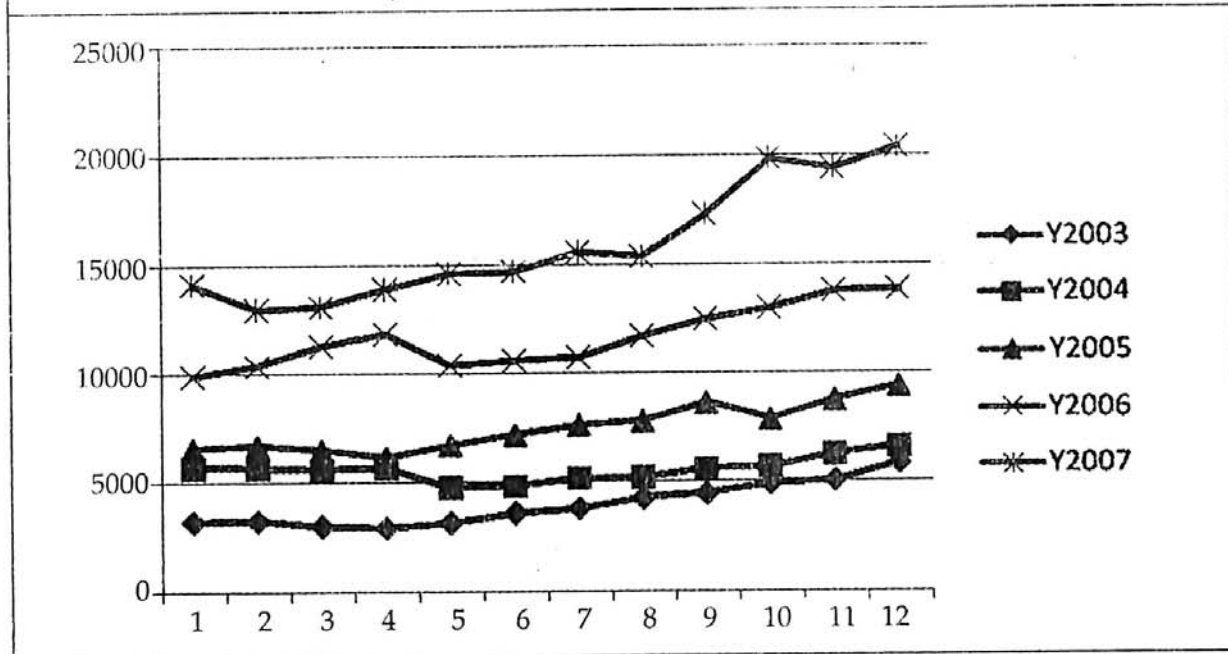


Table 2: Dispersion Statistics for the Study Period

Year	Period	QD	MD	SD
2003	Q1	117.47		
	Q2	323.67	158.65	
	Q3	330.32		888.78
	Q4	466.04	550.01	
2004	Q1	52.53		
	Q2	447.73	388.75	
	Q3	206.64		508.79
	Q4	465.21	450.63	
2005	Q1	110.52		
	Q2	280.33	248.21	
	Q3	499.53		994.13
	Q4	752.8	581.34	
2006	Q1	680.03		
	Q2	726.66	551.75	
	Q3	855.27		1245.43
	Q4	412.5	924.62	
2007	Q1	576.41		
	Q2	389.07	570.87	
	Q3	986.5		2541.02
	Q4	506.34	1902.72	

By applying the techniques of measures of dispersion the figures in the Table 2 could be derived. The figures are in Table 2. See Graph 2 for the graphical representation of dispersion statistics.

Quartile deviation is calculated to know the average amount by which the quartiles will differ from the median. From the Table 2, it can be observed that quartile deviation follows similar trend for 2003 and 2005 and it is different from rest of the years. The mean deviation for the second half of each year is greater than that of the first half which indicates that the average difference between the index and the median or mean increases. The standard deviation calculated helps in measuring the absolute dispersion. Increase in the standard deviation indicates that there is greater amount of dispersion during this quarter. It is worthwhile to note here that the third quartile contains the month of October. Hence, to naked eye it looks as if the month of October has a significant trading volume.

Graph 2: Dispersion Graph for the Study Period

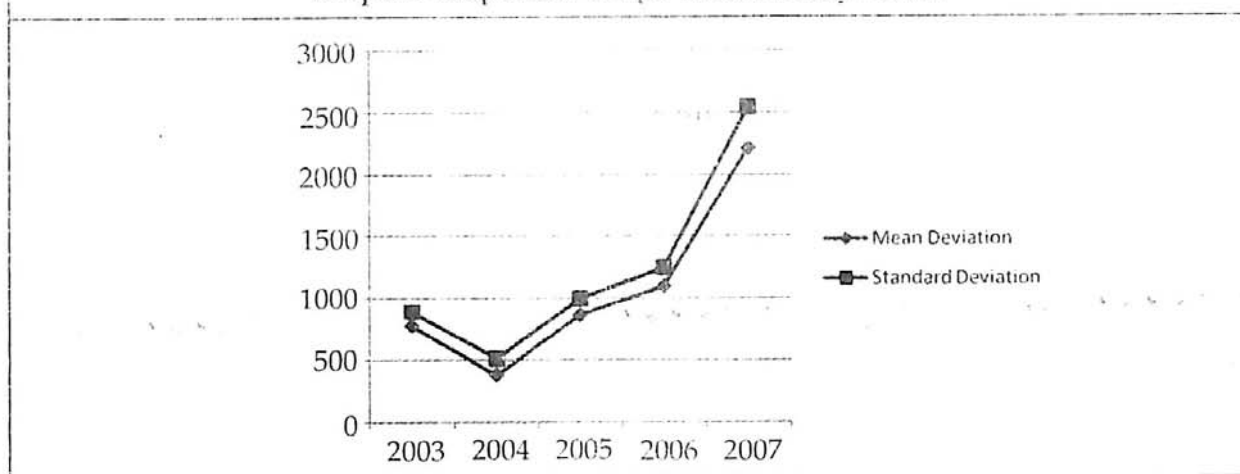


Table 3: Year-wise t-Significance Test for Mean for all Quartiles

	2003	2004	2005	2006	2007
Q1	0.87	0.195	0.92	0.91	1
Q2	0.81	0.95	0.815	0.56	0.61
Q3	0.22	0.46	0.53	0.012	0.057
Q4	1.45	1.2	1.2	1.48	1.5

To ensure statistical relevance on eye verification, a Run test was conducted in order to know whether the quartile deviations as calculated were significant so that the effect of October can be felt on the index of BSE. The results of t-test are given in Table 3.

To check the hypothesis of steady state from the dynamics of the cardiovascular signals run test is applied, the values of which are given in Table 4.

The various values of significance of the tests are given below:

Test at 5% significance level ($\alpha = 0.05$ & $z = 1.96$)

Upper Limit = 12.74

Lower Limit = 5.68

Since, Lower Limit < r < Upper Limit, the Null Hypothesis is accepted.

Test at 10% significance level ($\alpha = 0.1$ & $z = 1.65$)

Upper Limit = 12.19

Lower Limit = 6.24

Since, Lower Limit < r < Upper Limit, the Null Hypothesis is accepted.

n	20
r	12
n_1	6
n_2	13
μ_r	9.21
σ_r	1.81

Interpretation and Major Findings

From the above discussion which was focused on finding an October effect on BSE in the lines of January effect which has been majorly researched into comes to two broad conclusions.

In the first instance as has been observed by the data at the various deviations calculated October seems to be having a major influence on the stock Index. One is

tempted to conclude at this point that the month of festive 'October' is definitely a market jubilant pill. These as we all agree that the month of October is emotionally, religiously and fiscally the strongest month for Indians because people at large are on a buying spree.

However, on a closer verification using statistics we find that our Null Hypothesis which was stated to be having 'No October Effect' seems to be statistically significant.

The fact remains that October seems to be not influencing the BSE and it could be attributed to the following facts:

- Despite the fact that October is one of the most affluent times for public at large in India, probably this is also the period in which most of the festives in India are celebrated. This means that the money in pocket is deviated to buying consumables rather than stock.
- October also happens to be not the end of any quarter. Hence, the focus is on performance and not on market. Anticipation of third quarter result change could possibly uphold the spirit of wait and watch.

Hence, it can be broadly conclude that despite the visible effect of change the mean movement quartile do not significantly show any change. This is why October effect is not a significant phenomenon in Indian stock market.

Conclusion

October has been traditionally a scary month for stock market. Contrary to the January effect in western countries where the past studies by eminent scholars show that there is a clear impact on the market during that period. However, the study shows that there is nothing special about October, in spite of it being the month of festivals in India. There is a perception that the stock market tends to do poorly in October. Although historically there has been a slight underperformance in October which most observers attribute to chance, the psychological effects of a few serious market crashes in October have kept the perception alive. Today, the October effect is considered mainly to be a psychological expectation rather than an actual phenomenon and most statistics go against the theory. ♦

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