Examination Of January, December And November Effects On The Indian Stock Market

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INTRODUCTION

It was three decades back (1976) when Rozeff and Kinney documented the evidences of higher returns in the month of January in comparison to other months over the US stock market. And after that, various studies identified the mixed evidences of January Effect on the stock market world over. A vast literature is available giving multi explanation of January effect in various capital markets the world over. The fittest explanation for the January effect in most of the capital market was related with the tax-loss selling hypothesis. December is found to be at the end of the financial year in some countries and the investors set off their loss through the capital gains on other avenues and regain their position in the month of January, which causes further gushes in the market movements in the month of January and smart investors can earn abnormal returns by waiting for some time and opt to sell strategies in the month of January as the returns in this month are comparatively high. Most of the studies in this context were conducted on American and European Markets. No strong evidences have been found for the January Effect in the countries where the financial year starts in the month other than January. Jacobs and Kenneth (1988) identified that the stocks earned higher returns as well as higher risk premium in the month of January, especially in the case of small stocks. But the Indian market has not witnessed January effect as in India, the financial year ends in the month of March. But some other months have depicted the anomalous pattern in the distribution of stock indices returns during various months of the year (Chatterji and Maniam, 1997, Pandey 2002, Raj and Damini, 2006 etc.). So, the present study has been destined to examine the possible existence of the January Effect and in consideration of the past findings, the anomalous behavior of the stock index return series has also been examined in the month of December and November. Any kind of inconsistency in the behavior of the return series of the stock indices resulting due to these effects may result in profitable opportunity for the investors and fund managers. So, if some strong evidences could be obtained through the present study for such anomalous patterns in the market behavior, then it may raise a question on the strong arguments developed in favor of increased efficiency over the Indian stock market during the past years.

REVIEW OF LITERATURE

The calendar anomalies are a strong reason to challenge the notion of Efficient Market Hypothesis. Numerous studies are on hand to document evidences in favor of such anomalies. Some of these studies documenting monthly anomaly are stated here under.

Rozeff and Kinney (1976) investigated the New York Stock exchange for the period from 1904 to 1974; they found that the average return in January was approximately 3.5%, while the return in January was much higher than average returns in the other months. Their study gained the attention of various market participants and academicians and many researchers continued to work on their findings. The other famous study was conducted by **Gultekin and Gultekin (1983)** and they found that the mean returns of the January month were quite larger than other months of the year. It was a comprehensive study conducted on 17 countries. **Keim (1983)** documented in favor of January effect. **Lakonishok and Smidt (1988)** tried to examine the semi-month effect by using the DJIA data from 1897 to 1986 and strongly rejected the possibility of the semi-month effect.

Jaffe and Wasterifeld (1989) found a weak monthly effect in stock returns in many countries. A study by Raj and Thurston (1994) indicated that there was no January and April effect in New Zealand. **Boudreaux (1995)** extended Jaffe and Westerfield's results by investigating the monthly effect in markets in Denmark, France, Germany, Norway, Singapore/Malaysia, Spain and Switzerland. An end-of-the-month effect was found in the Danish, Norwegian and German markets. An inverted (negative) effect was found in the Pacific basin market of Singapore/Malaysia. Their study further reported the significant different returns in the month of January but their study was not able to find proper reasoning for all these differences. **Johnston and Cox (1996)** documented that the firms with largest decline in

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the last six months showed positive January returns in the following year with a tax loss selling reasoning. The impact of seasonality was also found differently on the firms with difference in size. **Chatterjee and Maniam (1997)** documented January effect as well as December effect. **Athannassakos (1997)** found January effect in USA and Canada. **Lee (1992)** also found same results for pacific-basin countries. **Tan and Tat (1998)** found the January effect, the day-of-the-week effect, the turn-of-the-month effect and the holiday effect in the Singapore market over a 20 year period from 1975 to 1994. **Pandey (2002)** documented the presence of the seasonal or monthly effect in stock returns in Sensex. His study covered the post reform period. The results confirmed the existence of seasonality in stock returns in India and the January effect. The findings are also consistent with the 'tax-loss selling' hypothesis. **Al-Rjoub (2002)** investigated market anomalies in the US stock and futures markets, and found that the small firm turn-of-the-year effect is weaker in the years after it was made famous in the academic literature. **Maghayereh (2003)** investigated the seasonality of monthly stock returns and January effect for the period 1994-2002, but found no evidence of monthly seasonality as well as January effect in Jordan stock market.**Tonchev and Kim (2004)** studied the calendar effects in three Eastern European countries' stock markets, and found, **(1)** The January effect in the Czech Republic, **(2)** Weak evidence for the day-of-the-week effect in Slovenia, but in the opposite direction, **(3)** Some evidence for two calendar effects in variance (January effect for Slovenia and the half-month effect for the Czech Republic). **Chan and Singal (2004)** studied the January effect by taking common stocks traded on the New York Stock exchange, the American Stock Exchange and NASDAQ for a study period of 1993-1999. He reported tax-related selling as the main cause of the January effect. **Gao and Kling (2005)** examined calendar effects in Chinese stock market, particularly monthly and daily effects. In Shanghai and Shenzhen, the year end effect was strong in 1991- but disappeared later. As the Chinese year-end is in February, the highest returns can be achieved in March and April. **Mitchell and Ong (2006)** examined returns in the Chinese A and B stock markets from 1990 to 2002 and found some evidence of a February turn-of-the-year effect which may be owing to the timing of the Chinese Lunar New Year (CLNY).**Kolahi (2006)** studied the turn of the month effect on two European stock markets and concluded that the average returns for European stocks were higher for the last day of the calendar month and the very first days for the next calendar month. The monthly effect was independent from other known calendar anomalies such as January effect, and the results were found consistent with that of US stock market results. **Dhankar and Madhumita (2006)** investigated four calendar anomalies, viz., Day of the Week effect, Monthly effect, Turn of the month effect and Month of the year effect across five countries of South Asia. The month of the year effect was not documented in any of the country considered in their study. **Raj and Damini (2006)** studied week day effects, day of the week, weekend, and January April effects were examined by applying a variety of statistical tools and documented evidences against the January effect and Monday effect on the Indian stock market. The results are interesting and contradict some of the findings found elsewhere. The negative Monday effect and positive January effect was not found in India. **Wafa, Liew and Chia (2007)** examined the calendar anomalies in the Malaysian stock market during and after the Asian Financial crisis. Their study documented January effect as well as other monthly seasonalities. So motivated by such a colossal evidences in favor of seasonalities over the stock markets world over, the present study has also intended to document the status of January Effect on the Indian stock market.

OBJECTIVES

As stated above, the present paper is focused towards the identification of anomalous behavior of the stock indices return series during particular months of the year. To be more specific, the present study seeks to attain the following objectives.

- To examine the existence of January/December/November Effects on the Indian stock market and to examine the possibility to develop superior investment strategy to earn abnormal returns in the months of January, December or November in comparison to other months of the year.
- If any of the above effects are found to be existing during the study period, then to explore the possible causes for the anomalous behavior of stock indices return series during that month particularly.

HYPOTHESES

In order to obtain the above stated objectives, the following hypotheses have been examined through statistical tools.

(a)January Effect

H0:That the average returns in January month are equal to the average returns in each of the other months of the year.

$$\mu 1 = \mu 2 = \mu 3 = \mu 4 = \mu 5 = \mu 6 = \mu 7 = \mu 8 = \mu 9 = \mu 10 = \mu 11 = \mu 12$$

H1:That there is difference in the mean returns of January from mean returns of other months resulting into inefficiency in the behavior of stock indices return series.

(b)December/ November

H0: That there is no difference in the distribution of mean returns of stock index series during the month of December/November/ April (for each month effect, the individual month is considered, for example: for December Effect, mean returns of only the December month will be considered) and mean returns of rest of the year

$\mu 1 = \mu 2$ (where $\mu 1$ is the mean returns of individual month for which anomalous behavior is to be examined and $\mu 2$ is the mean returns of rest of the year).

H1: $\mu 1 \neq \mu 2$

DATA INPUTS AND RESEARCH METHODOLOGY

To present the evidences with regard to the objectives stated above, the study at hand has considered two major indices of Bombay Stock Exchange, i.e., **(i)** BSE 100, **(ii)** BSE 200. The daily observations of closing values of these indices have been considered for descriptive statistics and for the application of statistical tools stated in the following section. The present study has considered a time period ranging from July 1997 to December 2007. All required data have been obtained from PROWESS database provided by CMIE, Mumbai. Further, the daily closing prices of the stock indices are converted into daily return series by taking natural log of the difference in the price at time t and price at time

$$t\text{-}1\ [\ Rt = \{Ln\ (Pt\ /Pt\text{-}1)\}]$$

To determine the distributional characteristics of monthly returns for both stock indices, the descriptive statistics through mean (simple arithmetic average), median, standard deviation, skewness, Kurtosis, and Jarque Bera statistic, for all months of the year have been analyzed. Supplementary to the descriptive statistic, the validity of the null hypothesis has been examined by t-statistic and Kruskal-Wallis H test. The F-statistic has also been applied to test the joint hypothesis that all the coefficients for February through December are simultaneously equal to zero and alike is also done for other calendar anomalies. The Kruskal-Wallis H test is based upon the assumption that the random variables are continuous and measurable on an ordinal scale. It uses the ranks of the data rather than continuous and measurable on an ordinal scale. It uses the ranks of the data rather than their raw values to calculate the statistic. In our case, we will test the hypothesis that all twelve of the populations from which the twelve samples (for January Effect) are drawn have identical population distributions. Consequently, the Kruskal-Wallis H-statistics is obtained in the framework given below:

$$H = 12/N*(N+1)\sum_{ki=1}^{k}(T_k)^2/n_k - 3*(N+1)$$

Where k is the number of groups (12 months), $\mathbf{n_k}$ is the number of observations for each group, n is the total number of observations, and N is the total number of observations, and $\mathbf{T_k}$ is the sum of ranks received by the returns in the kth group. The sampling distribution of H is a very close approximation to the chi-square distribution with k-1 degrees of freedom. Needless to add, Kruskal-Wallis H test follows χ^2 distribution with (k-1) degrees of freedom. Therefore, underlying x^2 values are compared with Kruskal-Wallis values to examine the validity of null hypotheses for 0.05 and 0.01 levels of significance.

Further, in case of one way ANOVA, the observed value of F-statistic is calculated as:

$$\textbf{F-observed = Between Group Mean/ Within Group Mean}$$

The null hypothesis will be rejected if the F-observed is greater than the F-table value at the selected level of significance (i.e., 1 or 5 percent level).

RESULTS OF DESCRIPTIVE STATISTICS

(i) BSE 100 Index : The results of descriptive statistics for BSE 100 index are cited in Table 1(b) given at the end of this paper. The months with highest mean returns were December (0.2815), followed by November (0.2519), February (0.1472) and August (0.1155) respectively. The April was the month with the lowest mean returns having negative sign which was followed by March, May and October respectively. All these months with lowest returns were found with negative sign in their mean returns. Further, the months with highest mean returns were showing least volatility in terms of its standard deviation coefficient of their return series. The months with lowest mean return are highly volatile and in this category, May, March and April could be given ranking in terms of highest volatility in the distribution of

their monthly returns. Further, the returns of October and December months were positively skewed; rest all of the months have shown negatively skewed distribution in their returns dispersion. Added to this, the asymmetry in the return distribution was also depicted by Kurtosis. Majority of the months had shown lesser peakedness in their return distribution curve than normal curve as these months had platykurtic (Kurtosis< 3) nature of distribution pattern. But the Jarque-Bera Statistic did not confirm this asymmetry and showed that the distribution of mean return series of stock index during various months followed normal curve distribution pattern. The probability of it was quite higher than the two selected levels of significance considered in the study (0.05 and 0.01). The descriptive statistics have given evidences of symmetry in the distribution pattern of returns during various months of the year.

(ii) BSE 200 Index : During the study period, there were a total 126 monthly observations which were calculated through 2621 daily observations for various months of the year to empirically examine the January effect. The Table 2 has shown the descriptive statistics for BSE 200 Index. As depicted in the table, the highest returns were shown in the month of December (0.2717) and April has shown lowest (-0.103) mean returns. After December, the November month fetched the attention of investors as the month having mean returns very close to the mean returns of December. Both these months with highest returns were in the category of least volatile months. May was found as a month with lowest mean returns (-0.029) and highest volatility (0.5831). The asymmetry in the distribution of monthly returns was also found through the more scattered returns towards the left hand side of the mean returns of that respective month as depicted by skewness coefficients. Only October and December were the months in which the distribution pattern of stock index series was towards the right hand side of its mean value. Further, November is the only month which has shown peakedness more than the normal curve (Kurtosis > 3), rest all eleven months have lesser peakedness in the distribution of their return series in comparison to the distribution of a normal curve. The Jarque Bera statistic was used to show the significance of asymmetry of the distribution of returns over various months through the difference of skewness and kurtosis coefficients of each month respectively. The monthly return series was not found non-normal as per Jarque-Bera statistic. A summary of the descriptive statistics has been given in Table 1(a).

Table 1 (a): Summary of Descriptive Statistics

Stock Indices→	BSE 100	BSE 200
Highest Mean Returns (Top Two)	December, November.	December, November.
Lowest Mean Returns (Bottom Two)	April, March	April, March
Highest Volatile Months (Top Two)	May, March	May, March
Least Volatile Months (Bottom Two)	December, July	December, July
Distribution Pattern of Monthly Return Series	*Symmetrical* ***(For all Months Individually)***	*Symmetrical* ***(For all Months Individually)***

ANALYSIS/INTERPRETATION OF METHODOLOGICAL OUTPUTS

(i) January Effect and Stock Indices Return Behavior: The findings obtained in the examination of January Effect through all methodological inputs are cited in Table 3. As stated above, different months during the year were identified which seemed to play significant role in determination of investment strategies of the investors. But the results obtained through t-coefficients and other statistical tools used in the present study have not shown any signals of significant difference in the mean returns of January month and mean returns of other months (at 1 percent level of significance). But at 5% level of significance, one significant anomalous pattern was identified. It occurred in the month of November. Both the market proxies collectively reported significant differences in the mean returns of January and mean returns of November resulting in abnormal profits for the investors. No other month was reported to show significant difference in its mean returns with the mean returns of January. But no such depictions were identified through Kruskal-Wallis H test and F-test. A further investigation is made in the following sections to examine the behavior pattern of mean return distribution in the month of November on the investors' strategies. All the above depictions showed that some months really play an important role in determining the investment strategy. Even the

evidences obtained in the month of December were also found necessary to be considered for further examination as the t-coefficients for both the market proxies were found positive with high magnitude in the month of December indicating higher mean returns in the month of December in comparison to mean returns in the month of January. Further, although the t-coefficient of December month did not report any significance, but these were found more than one which gave a suitable reason to examine the December Effect over the Indian stock market. The March, April months showed that the lowest mean returns might happen due to tax-loss selling hypothesis as March is the end of the financial year in India. The results of descriptive statistics as well as tests used to examine the significance of difference in the mean returns of January with other months had showed that a further examination should be made for December Effect, November Effect, April Effect and Diwali Effect before concluding that in which month buy and sell strategy should be opted by investors. These Effects have been examined in the following paragraphs to reach the final conclusion of how different months of the year behaved, thereby resulting in abnormal returns for the investors.

(ii) December Effect and Stock Indices Return Behavior: The empirical evidences documented in Table 4 strongly supported the significant higher returns in the month of December in comparison to other months of the year. The t-values were found significant at both levels of significance (5% and 1%) in case of BSE 100 and BSE 200 for mean returns in the month of December. Although the t-statistic results did not indicate lesser mean returns in the remaining all months of the year (as the t-coefficient was found positive) but the another parametric test of the study, i.e., F-test has shown significant difference in the mean returns of December and mean returns of the remaning months of the year at 5% level of significance for both indices. Same results were added through the non-parametric test considered in the study. The results indicated that in case of companies with large market cap, the December returns were generally reported significantly different from zero resulting in more profitable opportunities for the investors. The difference in the mean returns of December and rest of the year is also depicted through graphs [figures 1(a) and 1(b)] for both of the market proxies considered in the present study.

(iii) November Effect and Stock Indices Return Behavior: In the above paragraphs, the evidences were found stating the importance of the December month through all the market proxies. Another significant month identified through statistical informations stated in the previous paragraphs was November. The November Effect studies the significance of stock returns in the month of November in comparison to the average returns of the rest of the year. In the following paragraph, the findings of the November Effect are discussed and the difference in the methodological outputs of various market indices are gazed at to draw a consensus on the existence of November Effect and December Effect over the Indian stock market. Table 5 has reported the findings of the various methodological tools used in the study to empirically test the significance of returns in the month of November in comparison to mean returns of the remaining months of the year.As depicted in the Table 5, some signals of the November Effect were identified in BSE 100 and BSE 200 index return series when examined through non-parametric test at 5 percent level of significance. The overall results supported the existence of November effect in mid and small cap stocks rather than in the case of large cap companies.

CONCLUSION, SUGGESTIONS AND POLICY IMPLICATIONS

The findings obtained in the above sections have clearly negated the presence of January anomaly over the Indian stock market. Instead of January, the December and November months were found more significant in terms of higher returns to the investors in comparison to other months of the year. Even the possible existence of tax-loss selling hypothesis was found least; if it would have existed in the Indian stock market, then probably, the April month would be giving highest average returns to the investors but the results showed it to be the month with lowest mean returns. There can be multiple reasons for the existence of December and November effects during the sampled period. Further, the Indian rituals and cultural reasons are also responsible for decreased returns of October. The sluggish behavior of the market movement during this period ends in the month of November. Moreover, the results of the second quarter are also announced by most of the Indian companies and many good announcements are expected during this phase. In addition, the Christmas celebrations also add to the positive movements in the market. The financial year of the MNCs end in December, so these corporate houses are expected to speak out about their financial achievements as well as policy framework for the future period. All this results in re-energizing the market movements. Although the behavior pattern of the FIIs movement could not be associated with these anomalous patterns. When past trends of FIIs inflows in the Indian capital market were examined, then the April month recorded the highest investment by FIIs. If an order is determined from highest to lowest investment by the FIIs, then the order will be July, February, March, October, December, November, January, June, April, August and May (negative

investment). So if the FIIs have played an important role in these seasonal anomalies, then September would be the month with highest mean returns in comparison to the mean returns of the rest of the year. The withdrawal of FIIs in the month of May certainly added to the prolonged downturn and resulted in irregular behavior of the market in May as highest volatility was reported in the month of May. So the above discussions indicated that the investors and fund managers may get significantly higher returns even by a short term buy and sell strategy (as lowest returns in the months of mean April and March and highest returns in the months of December and November). The anomalous behavior of the return series of the stock indices may be a result of or seasonality of derivative markets in India. So, further research can also be made on the examination of correlation of spot market seasonality and derivative market seasonality to have more elaborated explanation of the above discussed anomalous patterns in the Indian stock market. Moreover, a continuous research should be conducted for the examination of such anomalous patterns as generally these anomalies disappear after a long time once they come into the notice of the investors.

Table 1:Descriptive Statistics for Various Months of The Year and BSE 100

Month↓	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability	Observations
Jan	0.0617	0.1062	0.3363	-0.667	2.6249	0.7993	0.6706	10
Feb	0.1472	0.1361	0.3357	-0.176	2.5779	0.1256	0.9391	10
March	-0.092	0.035	0.5004	-0.786	2.7549	1.0536	0.5905	10
April	-0.128	-0.066	0.4392	-1.02	3.1188	1.7396	0.419	10
May	-0.04	0.0031	0.5561	-0.03	1.6898	0.7168	0.6988	10
June	0.0697	0.1258	0.3509	-0.812	2.9127	1.1024	0.5763	10
July	0.0524	0.1087	0.3126	-0.525	2.2068	0.7945	0.6722	11
Aug	0.1155	0.1241	0.3914	-0.062	2.5106	0.1169	0.9432	11
Sept	0.0451	0.1708	0.4342	-0.616	2.3954	0.8624	0.6497	11
Oct	-0.019	0.0073	0.3723	0.2435	2.102	0.4783	0.7873	11
Nov	0.2519	0.3296	0.3155	-1.076	3.3781	2.1891	0.3347	11
Dec	0.2815	0.2873	0.2682	0.5699	2.396	0.7626	0.683	11
Total	0.065	0.1198	0.3921	-0.6434	3.1646	8.8362	0.0121	126

Table 2 :Descriptive Statistics for Various Months of The Year and BSE 200

Month↓	Mean	Median	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability	Observations
Jan	0.059	0.1119	0.3278	-0.724	2.6547	0.9239	0.63	10
Feb	0.1414	0.1495	0.313	-0.46	2.6272	0.4111	0.8142	10
March	-0.084	0.0421	0.5006	-0.806	2.6914	1.1234	0.5703	10
April	-0.103	0.0022	0.4744	-1.054	2.9569	1.8527	0.396	10
May	-0.029	0.0252	0.5831	-0.169	1.8579	0.5911	0.7441	10
June	0.0602	0.1327	0.3468	-0.796	2.9237	1.0574	0.5894	10
July	0.0579	0.1488	0.2978	-0.529	2.237	0.7795	0.6772	11
Aug	0.1209	0.1553	0.3729	0.0033	2.4983	0.1154	0.9439	11
Sept	0.047	0.1696	0.4236	-0.608	2.4016	0.8414	0.6566	11
Oct	-0.005	0.0258	0.3614	0.1178	2.0318	0.4551	0.7965	11
Nov	0.2419	0.3401	0.3001	-1.184	3.7019	2.7941	0.2473	11
Dec	0.2717	0.2847	0.2572	0.5291	2.4638	0.645	0.7243	11
Total	0.0677	0.1372	0.3875	-0.7646	3.4234	13.2187	0.0013	126

Table 3 : Statistical Results for January Effect

Indices/ t-test→ Months↓	BSE 100		BSE 200	
	Coefficient (S.E.)	t- test (p value)	Coefficient (S.E.)	t- test (p value)
January	0.0617	0.580	0.059	0.569
	(0.10640)	(0.576)	(0.1037)	(0.583)
February	0.0855	0.5296	0.0824	0.5228
	(0.1615)	(0.6092)	(0.1577)	(0.6137)
March	-0.154	-0.703	-0.143	-0.663
	(0.2183)	(0.4996)	(0.2157)	(0.524)
April	-0.19	-0.891	-0.162	-0.733
	(0.2127)	(0.3959)	(0.2217)	(0.4824)
May	-0.102	-0.544	-0.088	-0.458
	(0.1877)	(0.5998)	(0.191)	(0.6576)
June	0.008	0.0666	0.0012	0.0102
	(0.1198)	(0.9484)	(0.1177)	(0.9921)
July	-0.015	-0.09	-0.01	-0.063
	(0.1671)	(0.9306)	(0.1609)	(0.9509)
August	0.1211	1.0012	0.1266	1.0702
	(0.1209)	(0.3429)	(0.1183)	(0.3124)
September	-0.012	-0.053	-0.006	-0.026
	(0.2188)	(0.9592)	(0.2125)	(0.9795)
October	-0.083	-0.567	-0.067	-0.479
	(0.1466)	(0.5844)	(0.139)	(0.6435)
November	0.2622	2.599**	0.2532	2.6853**
	(0.1009)	(0.0288)	(0.0943)	(0.025)
December	0.2353	1.4552	0.2301	1.4614
	(0.1617)	(0.1796)	(0.1575)	(0.1779)
K W H test (p-value)	2.322		1.825	
	(0.677)		(0.768)	
F-test (p-value) Df(between, within)	1.333 (0.216)		1.184 (0.306)	
	(11, 108)		(11, 108)	

- *Significant at 0.01 Level, **Significant at 0.05 Level. Test Value for t- test: 2.262 (at 5%) and 3.25 (at1%)
- Test Value for Kruskal -Wallis H Test : 9.49 (at 5%) and 13.3 (at 1%), Test Value for F- test: 1.8 (at 5%) and 2.4 (at 1%).

Table 4: Statistical Results For December Effect

Indices→	BSE 100		BSE 200	
	Coefficient (S.E.)	t-test (p -value)	Coefficient (S.E.)	t-test (p -value)
Rest of the Year	0.323	0.679	0.0376	0.862
	(0.476)	(0.5 12)	(0.436)	(0.409)
December Month	0.2492	4.46*	0.2342	4.156*
	(0.056)	(0.001)	(0.065)	(0.002)
K -W H test (p –value)	4.839** (0.028)		5.132** (0.023)	
F -test (p -value) ***Df between, within)***	7.049** (0.015) ***(1, 20)***		6.932** (0.0160 ***(1, 20)***	

- ***Significant at 0.01 Level, **Significant at 0.05 Level.Test Value for t-test: 2.228 (at 5%), 3.169 (at 1%)**
- **Test Value for Kruskal-Wallis H test: 3.84 (at 5%) and 6.63 (at 1%), Test Value for F-test: 4.35 (at 5%), 8.10 (at 1%)**

Figure 1(a)

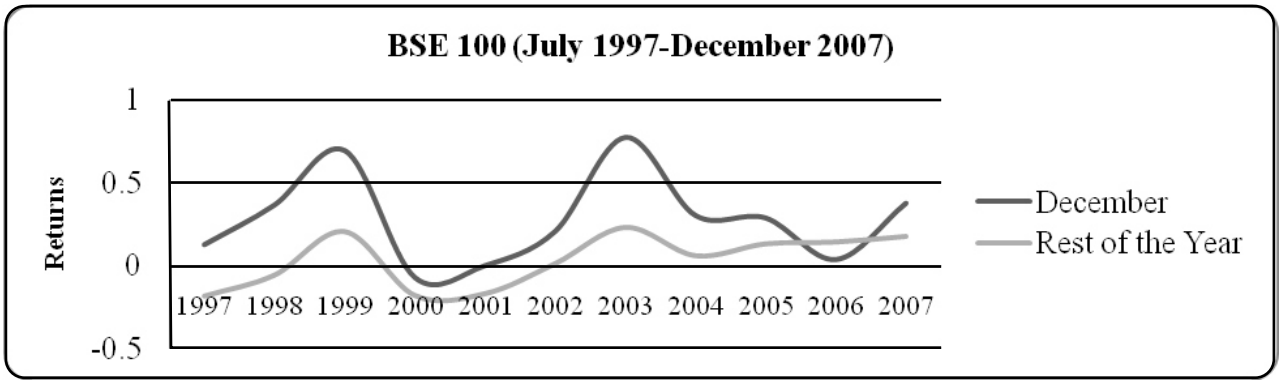


Figure 1(b)

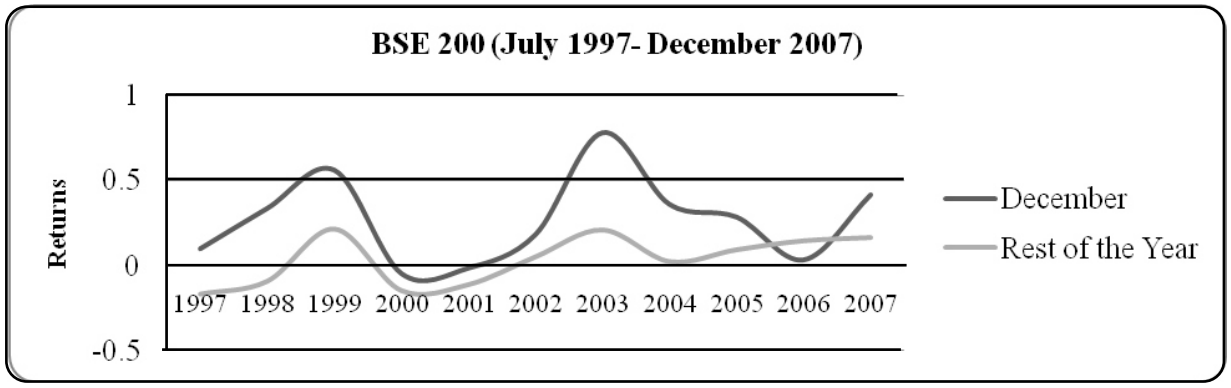


Table 5: Statistical Results for November Effect

Indices→	BSE 100		BSE 200	
	Coefficient (S.E.)	t-test (p -value)	Coefficient (S.E.)	t-test (p -value)
Rest of the Year	0.0416	0.909	0.0458	1.003
	(0.0457)	(0.385)	(0.0457)	(0.339)
November Month	0.2103	2.0016	0.1960	1.9464
	(0.1051)	(0.0732)	(0.101)	(0.0802)
K -W H test (p -value)	4.554** (0.033)		5.132** (0.023)	
F -test (p -value) ***Df (between, within)***	3.972 (0.06) ***(1, 20)***		3.740 (0.067) ***(1, 20)***	

- ***Significant at 0.01 Level, **Significant at 0.05 Level. Test Value for t-test: 2.228 (at 5%), 3.169 (at 1%)**
- **Test Value for Kruskal -Wallis H test: 3.84 (at 5%) and 6.63 (at 1%) , Test Value for F -test: 4.35 (at 5%), 8.10 (at 1%).**

Figure 2(a)

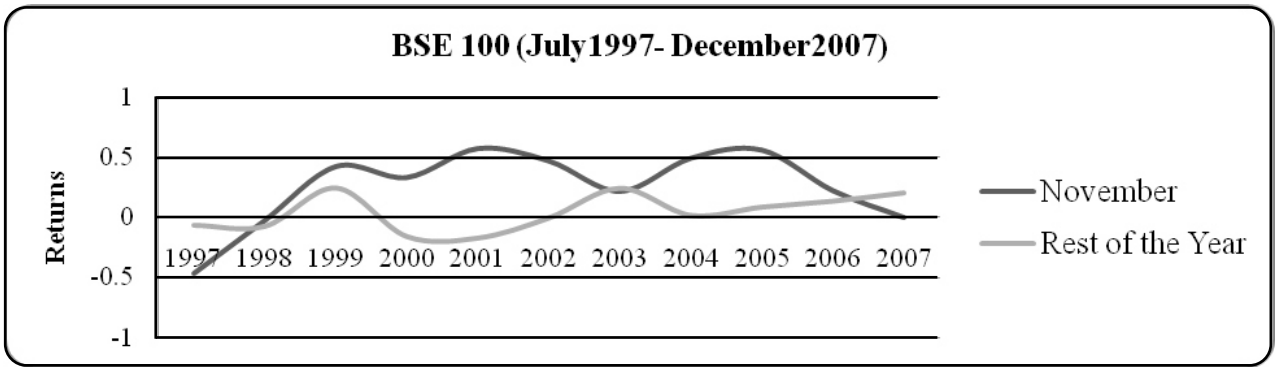
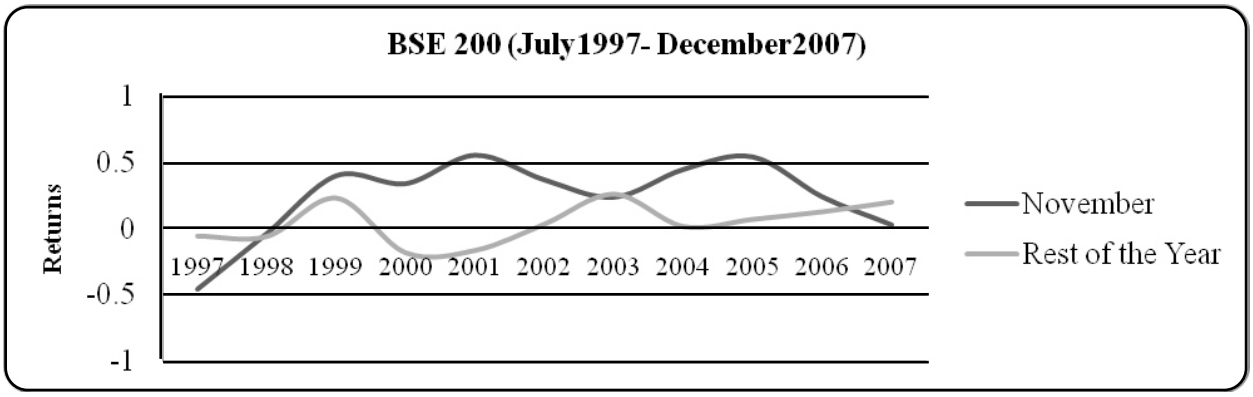


Figure 2(b)



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