Investigating the 'Month of the Year' Effect in India

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Abstract

The present study divided the past 25 years (from 1990 till the present) into three almost equal time periods and studied the 'month of the year' effect within them in the Indian context by use of the indices - BSE Sensex, BSE 500, BSE MidCap, and BSE SmallCap. The study observed that the 'month of the year' effect is different in each of the three time periods - 'February' effect for the period from January 01, 1990 – December 31, 1998 ; the 'November' effect for the period from January 01, 1999 – December 31, 2006 ; and the 'April' effect for the period from January 01, 2007 – April 01, 2015. However, for a given time period, the same 'month of the year' effect is present for all the indices studied. It was also observed that the 'month of the year' effect is stronger for small caps when compared to large caps.

Key words : **'April' effect, BSE 500, BSE MidCap, BSE Sensex, BSE SmallCap, January effect**

JEL Classification : G11, G12, G14

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This study seeks to examine the 'month of the year' effect in India and not necessarily the January effect. The January effect or the 'month of the year' effect is an asset pricing anomaly (a pattern in returns that is unexplained by the capital asset pricing model (CAPM)) which has been observed and studied by researchers in the developed world for a very long time. There have been studies that have observed and studied the 'month of the year' effect in India too, but what distinguishes this study from them is that the earlier studies have used indices like Nifty 50 or BSE Sensex that are constructed out of blue chip and well followed stocks. The behaviour of these indices could be very well different from midcap or small-cap stocks. This study addresses this issue by studying the Mumbai Stock Exchange (BSE) indices BSE Sensex, BSE 500, BSE MidCap, and BSE SmallCap for the 'month of the year' effect.

The BSE Sensex is comprised of 30 large capitalization, well-established, and financially sound companies across key sectors. The BSE 500 index, comprised of 500 stocks, represents around 93% of the total market capitalization of the BSE and covers 20 major industries of the Indian economy. The BSE MidCap index and the BSE SmallCap index are comprised of those BSE listed stocks which are of medium and small market capitalization, respectively.

The earlier studies have ignored the fact that the Indian market has undergone tremendous transformation during the time period from 1990 - 2015. This transformation could also have impacted stock return behaviour. The present study divides the past 25 years (from 1990 till the present) into three almost equal time periods and studies the 'month of the year' effect within them. The study observes that the 'month of the year' effect is different in each of the three time periods - 'February' effect for the period January 01, 1990 - December 31, 1998 ; 'November' effect for the period January 01, 1999 - December 31, 2006 ; and 'April' effect for the period

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January 01, 2007 - April 01, 2015. However, for a given time period, the same 'month of the year' effect is present for all the indices studied. It is also observed that the 'month of the year' effect is stronger for small caps when compared to large caps.

Rozeff and Kinney (1976) studied the U.S. market from 1904 till 1974 and observed that the average January stock market returns were 3.48%, while the monthly returns for the remaining 11 months of the year were 0.42%. Thus, January returns were more than eight times higher than a typical month's returns.

Gultekin and Gultekin (1983) examined the stock markets of 16 major industrialized countries for the time period from January 1959 to December 1979. They observed that disproportionately large January returns existed in most countries, and disproportionately large April returns existed in the U.K. Except for Australia, these months marked the turn of the financial (tax) year. They found that the January effect in the United States was lesser than that observed in the stock markets of many other countries.

Asteriou and Kavetsos (2006) studied the stock market indices of eight transition economies - the Czech Republic, Hungary, Lithuania, Poland, Romania, Russia, Slovakia, and Slovenia. The duration of their study was from January 1991 till May 2003. They discovered the January effect in four countries - Hungary, Poland, Romania, and Slovakia. Holden, Thompson, and Ruangrit (2005) analyzed the daily returns of the stock market index for Thailand (SET) for the time period from January 3, 1995 till December 29, 2000 and reported the existence of a January effect.

The January effect is stronger for small capitalization stocks. Haug and Hirschey (2006) studied the stocks listed on the New York Stock Exchange (NYSE) for the period from 1927-2004 and within the categories of large cap and small cap stocks did a ranking on the basis of book value to price ratio. They observed that both for small-cap and large cap stocks, the January returns grew monotonically for both small-cap and large cap stocks with increasing book value to price ratio. It was also seen that the January premium for small-cap stocks was much higher than that of large cap stocks, leading them to conclude that the January effect seemed a small cap phenomenon.

The results of Haug and Hirshey (2006) are echoed by Easterday, Sen, and Stephan (2009), who studied common stocks listed on NYSE, AMEX, and NASDAQ for the time period from 1946 - 2007. They concluded that for NYSE and AMEX stocks, small capitalization stocks had a higher January premium than others. They also reported that the January effect persisted for the entire duration of their study, that is, from 1946-2007, and did not show any decline at all. Moller and Zilca (2008) also provided evidence that the January effect is as strong as it was in the past and has not waned at all. They studied all the NYSE, AMEX, and NASDAQ stocks in the Center for Research in Security Prices (CRSP) monthly data file for the time period from 1927 till 2004.

However, Agnani and Aray (2011) stated that the January effect is not a small cap phenomenon alone and is present across all size categories (market capitalization) of stocks. They used the size portfolios' data taken from Prof. Kenneth R. French's website for the period from January 1940 till December 2006 to arrive at this conclusion.

The oft - cited explanation for the January effect is the tax-loss selling hypothesis. First proposed by Wachtel (1942) after a study of the data for the Dow-Jones Industrial Average index and 13 other indices for the U.S. market for the period from 1927 - 1942, this hypothesis proposes that investors decrease their taxes by booking losses at end of the year, thereby causing a fall in stock prices. Stock prices rise to reach their equilibrium levels after the financial year end, delivering abnormally high January returns. Branch (1977), in a study of stocks listed on the New York Stock Exchange (NYSE), found support for the tax loss hypothesis explanation for the January effect. Dyl (1977), in a study of a random sample of 100 common stocks from the 'Center for Research in Security Prices' (CRSP) database for the time period from January 1948 till December 1970, also found support for the tax loss hypothesis explanation for the January effect.

Keim (1983) observed that the January effect occurred every year (except two) from 1931 to 1979, even in time periods (e.g., before World War II) when personal tax rates were relatively low and when the gains due to the

capital loss offset were lower. The magnitude of the January effect seems insensitive to changes in the tax rate.

Jones, Pearce, and Wilson (1987) investigated the existence of the January effect using Cowles Industrial Index data for the period from February 1871 till December 1938 and observed that a January effect existed in the period before income taxation (the post-tax period is assumed to begin with 1918) and that there is not a statistically significant change in the effect after the introduction of taxation.

Tinic, Giovanni, and West (1987) studied the monthly returns of Toronto Stock Exchange 300 Index (TSE 300) for the time period from February 1956 till August 1981. Their study provided some support for the tax loss hypothesis, that is, it stated that the tax loss hypothesis accounts for some but not all of the January effect. Capital gains taxes did not exist in Canada before 1972. They observed that the January effect existed in Canada before and after the imposition of capital gains tax and that the imposition of capital gains tax did have a significant impact on the January effect in Canada; they also stated that the trading of U.S investors did not play a significant role in the seasonality of stock returns in the Canadian market.

Kim (2006), in a study of NYSE and AMEX stocks for the time period from 1972 till 2003, provided a risk-based explanation for the January effect and stated that the tax loss hypothesis does not explain the January effect. Another explanation for the January effect is the information hypothesis. Keim (1983) studied the daily returns of the stocks in the CRSP database for the time period from 1963 till 1979. Rozeff and Kinney (1976) and Keim (1983) stated that for firms whose fiscal year closes in December, the month of January is a period of high uncertainty due to the imminent release of significant fiscal year-end financial information, and this uncertainty causes the stock prices to fall. When this uncertainty gets cleared, stock prices rise. A majority of the firms listed on the New York Stock Exchange (NYSE) and the American Stock Exchange (AMEX) have their fiscal year ending on December 31. As per the information hypothesis, firms having their fiscal year ending in a non-December month would deliver high returns in the calendar month following their fiscal year end and not in January.

There are many instances of a 'month of the year' effect reported in stock markets of the world where the 'month of the year' is not January. The study of Ariss, Rezvanian, and Mehdian (2011), which used the daily closing values of all the GCC market indices (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and UAE) from inception until June 2008 gave evidence of a December effect in five GCC markets (Kuwait, Muscat, Qatar, Saudi Arabia, and Dubai). The data they used was from Global Financial Data. It is to be noted that the data series was from 1994 till 2008 except for Abu Dhabi, Doha, and Dubai, where the series was from 2002 till 2008.

Al-Saad and Moosa (2005) studied the 'month of the year' effect for the period for January 1984 till June 2003 in the monthly stock returns by employing the Global Market Index of the Kuwait Stock Exchange. They reported a July effect and not a January effect in the Kuwait Stock Market. They went on to add that since there was no taxation in Kuwait, the tax loss hypothesis cannot be the reason for the July seasonality.

Using data on six Chinese stock market indices taken from the Chinese Stock Markets and Accounting Research (CSMAR), Zhang, Sun, and Wang (2008) found a significant and positive March effect. The authors stated that this March effect cannot be explained by the tax loss hypothesis as China does not have tax on capital gains.

Studies of the January Effect or 'Month of the Year' Effect in the Indian Context

Siddiqui and Narula (2013) used S&P CNX Nifty data from 2000 to 2011 and reported the discovery of a 'November effect.' They concluded this to be evidence against the tax loss hypothesis as the operation of the tax loss hypothesis would imply the existence of an 'April effect.' This is because the Indian financial year is from April 1st till March 31st. Parikh (2009) tested for the ‘month of the year’ effect in India using Nifty 50 index's monthly returns for the time period from 1999-2008 and discovered a 'November effect' in the Indian context.

Yakob, Beal, and Delpachitra (2005) used the daily closing prices of an Indian stock index for the time period from January 2000 till March 2005. They discovered that significant negative returns occurred in March and April

; whereas, significant positive returns occurred in May (0.1913), November (0.4226), and December. Among the five significant months, April delivered the least returns, while November delivered the largest returns for the year.

Elango and Pandey (2008) employed monthly logarithmic returns of five indices of National Stock Exchange of India (NSE) for the period from 1999 - 2007. March and April delivered significant negative returns but turned out to be the appropriate months to purchase the scrips (buy low). November and December delivered significant positive high returns leading them to infer that these months are the best time to sell the securities (sell high). They suggested that the tax loss hypothesis and accounting information hypothesis could explain the anomalous behaviour in the Indian stock markets.

Chakrabarti and Sen (2008) used the monthly data of BSE Sensex and eight sectoral indices of the Mumbai Stock Exchange (BSE) to study calendar anomalies in the Indian context. The time period of the data was from February 1999 - December 2006. They discovered that a significantly positive November effect was present in the BSE Sensex and the eight sectoral indices.

Choudhary (2007) divided the time period from January 1996 till December 2006 into two sub-periods : 1996-2001 and 2002-2006, and investigated the existence of the 'month of the year' effect in the returns of the BSE Sensex and BSE 100 indices. Choudhary (2007) stated that while there was no evidence of 'the month of the year' in the first sub-period, the evidence in the second sub-period was in favour of the existence of a 'month of the year' effect.

Kaur (2011) studied the BSE 500 and S&P CNX 500 indices for the period from January 2002 till December 2009 and gave evidence in favour of the hypothesis that the returns in all the months are not equal, implying the existence of a 'month of the year' effect.

From the above literature review, we can infer that:

(i) The tax loss hypothesis cannot explain the January effect, and there are instances in stock markets across the world including India where research studies have reported the existence of a 'month of the year' effect with the 'month of the year' not being January. So, we can investigate for the existence of the January effect or any other 'month of the year' effect in India. This is because in India, the financial year is from April 1st till March 31st and the tax loss hypothesis would imply the existence of an 'April effect' in India.

(ii) The January effect exists for both small capitalization stocks and large capitalization stocks, but is larger for the former.

(iii) The January effect has not vanished since its discovery.

Gaps in Indian Studies

Most studies in the Indian context have been restricted to a single index, a popular index like the BSE Sensex or the Nifty 50 and have not covered the entire period from 1990 till the present, and even in cases where more than one index has been considered in the study, the choice of the indices is such that they do not represent all the segments of the market, that is, the large-cap stocks, mid-cap stocks, and the small-cap stocks. It has been seen in the U.S.A that the January effect, though present in both large and small cap stocks, is stronger in small-cap stocks. So, it does not suffice to study one or a few indices, which in most studies represent the large cap segment. The present study addresses this issue by considering indices which represent almost the entire cross-section of the Indian market, namely BSE Sensex, BSE 500, BSE MidCap, and BSE SmallCap.

The Indian studies seem to have ignored the fact that the Indian market has undergone tremendous transformation during the time period from 1990 - 2015. Introduction of a nationwide screen based trading system

(SBT), dematerialization of securities, fall in transactions, and entry of foreign institutional investors (FIIs) are among the major changes that took place. Raghuram (2009), in a study of the Indian stock market for the period from July 07, 1990 till June 30, 2006 discovered significant changes in the asset pricing behaviour in the aftermath of the introduction of the trading system (SBT).

The present study addresses this issue too. The present study divides the past 25 years (from 1990 till the present) into three almost equal time periods and studies the 'month of the year' effect within them. The study also observes that the 'month of the year' effect is different in each of the three time periods.

Data and Methodology

The study uses the daily price data of the Mumbai Stock Exchange (BSE) indices BSE Sensex, BSE 500, BSE MidCap, and BSE SmallCap sourced from the official website of the exchange, www.bseindia.com. The data considered for the various indices is shown in the Table 1.

The returns considered are daily percentage returns.

$$R_t = (P_t - P_{t-1}) * 100 / P_{t-1} \qquad (1)$$

For each series, the start date was chosen based on earliest date of the available data. A visual inspection of the graphs of average daily returns for every month for every index was done across the years. For example, the average daily returns for January were plotted across the years. The same was done for all the months.

The graphs for some select months for select indices only are included due to space considerations. The graph of average February daily returns for Sensex is given in the Figure 1. It can be clearly observed that the average daily returns for February were higher for the time period January 1990 - December 1998 than for any other period.

The graphs of average November returns for Sensex and BSE 500 are given in the Figure 2 and Figure 3. It can be clearly observed that the average daily returns for November were higher for the time period January 1999 - December 2006 than for any other period for both Sensex and BSE 500.

The graphs of average April returns for Sensex and BSE 500 are given in Figure 4 and Figure 5. It can be seen that since January 2006, the average daily returns for April for Sensex are on a rising trend. It can be seen that the average daily April returns for BSE 500 during the time period January 2006 - December 2014 are higher than the earlier period.

Based on the visual inspection of the graphs for the various indices, it was decided to split the returns data for the various indices as given in the Table 2. The break points were verified by use of Chow test (Chow, 1960) for each of the indices for each of the break points. The Chow test procedure and statistics are given later in this paper.

It has been observed that the seasonality of returns for each of these indices varies from one time period to another. Following Keim (1983), the following regression has been used to test the null hypothesis of equal

Table 1. Indices Used in the Study

Index	Time Period
BSE Sensex	January 01, 1990 till April 01, 2015
BSE 500	February 01, 1999 till April 01, 2015
BSE MidCap	April 01, 2003 till April 01, 2015
BSE SmallCap	April 01, 2003 till April 01, 2015

Figure 1. Average February Daily Returns for Sensex

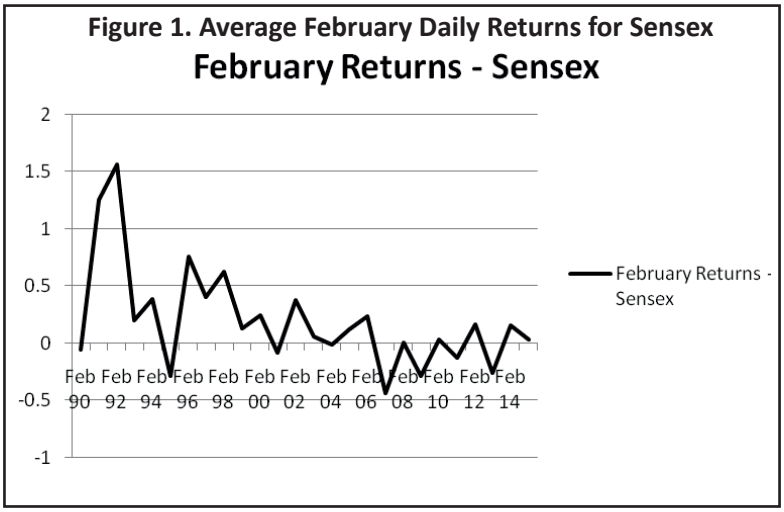

Figure 2. Average November Daily Returns for Sensex

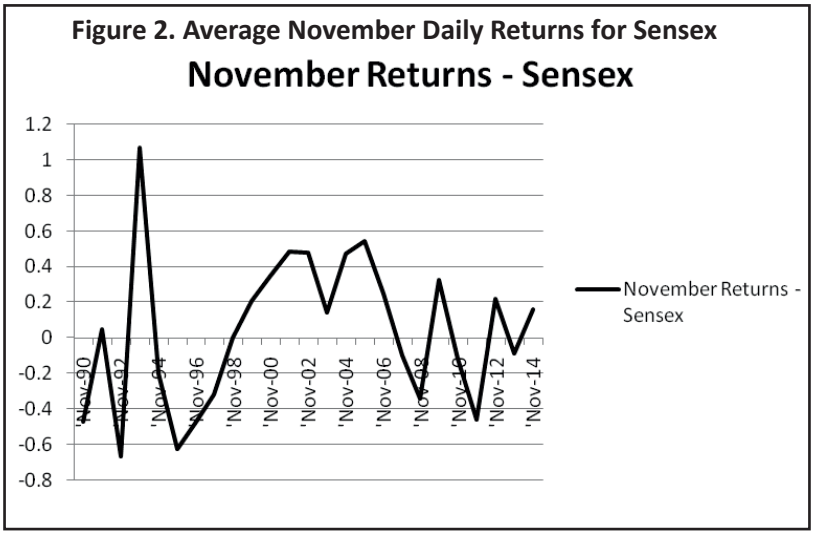

Figure 3. Average November Daily Returns for BSE 500

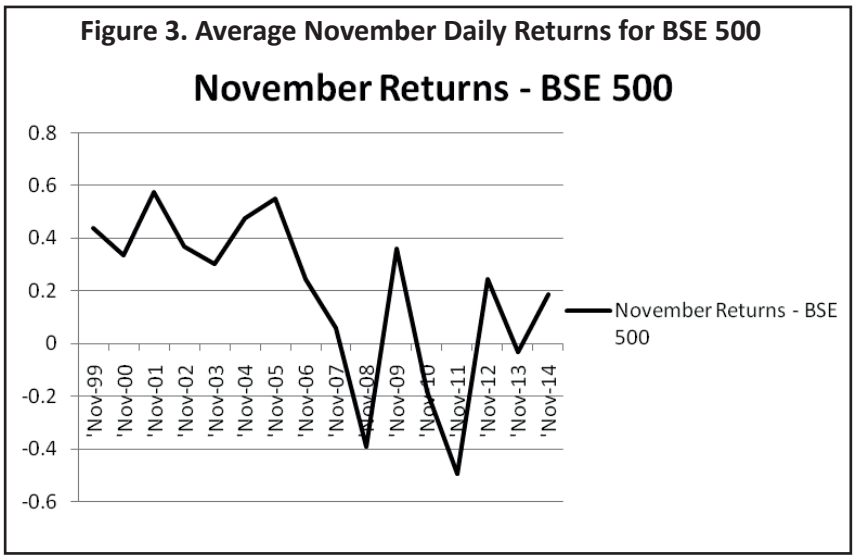

Figure 4. Average April Daily Returns for Sensex

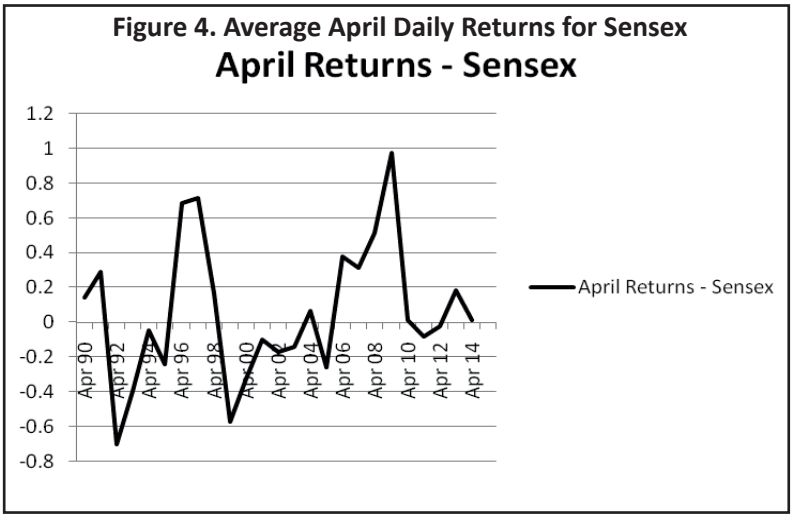

Figure 5. Average April Daily Returns for BSE 500

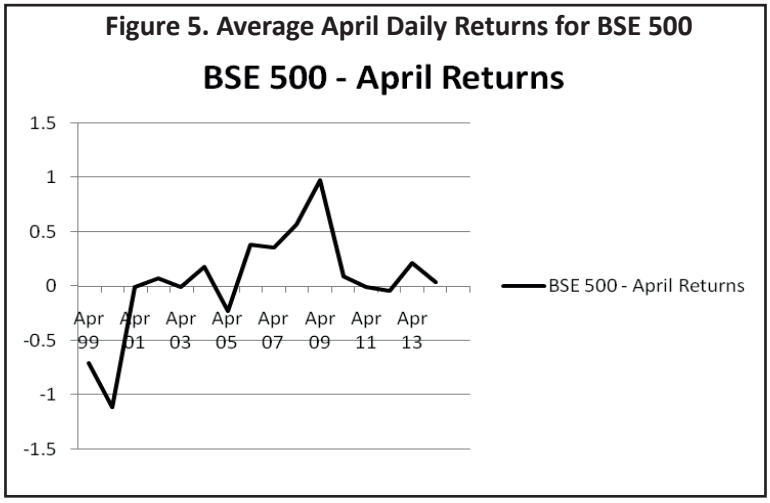

Table 2. Returns Time Series of the Indices Studied

Index	Time Periods Considered
	(Dates follow dd/mm/yy format)
BSE Sensex	01/01/90 till 31/12/98, 01/01/99 till 31/12/06, 01/01/07 till 01/04/15
BSE 500	01/02/99 till 31/12/06, 01/01/07 till 01/04/15
BSE MidCap	01/04/03 till 31/12/06, 01/01/07 till 01/04/15
BSE SmallCap	01/04/03 till 31/12/06, 01/01/07 till 01/04/15

expected returns for each month of the year :

$$R_t = a_1 + a_2 D_{2t} + a_3 D_{3t} + \ldots\ldots\ldots\ldots + a_{12} D_{12t} + e_t \qquad (1)$$

In the regression, R_t is the daily index returns for day t for the given index, and D_2 , $D_{3 \ldots} D_{12}$ are the dummy variables corresponding to the months February, March, April, and so on till December. For a daily returns observation R_t of a given month, the dummy variable corresponding to the given month takes a value of one and

the dummy variables corresponding to the other months take the value zero. January is used as the reference month. In the case of the expected returns being the same for each month of the year, the estimates of a_2 till a_{12} should not be significantly different from zero and the *F*-statistic giving the joint significance of the dummy variables should be insignificant.

The phenomenon of the constant or the dummy variable coefficient for one or more months being statistically significant is of academic and economic significance as it implies that the average daily returns for January (if the constant is significant) or the concerned months (whose coefficients are significant) are significantly different from the rest of the months. On the other hand, if the regression as a whole is significant and yet none of the dummy variable coefficients or the constant is significant, then that holds no academic or economic significance as far as the research objective of this paper is concerned.

This methodology of testing for the 'month of the year' effect given by Keim (1983) is a time-tested one and well accepted by researchers. Mehdian and Perry (2002), Fountas and Segredakis (2002), Marrett and Worthington (2011), Siddique and Narula (2013), and Singh (2014) are among the many authors who have used this methodology for testing the 'month of the year' effect.

As stated earlier, the Chow test was performed using the regression equation (1) to test for the stated breakpoints for each of the indices. The Chow test statistic can be stated as follows :

$$F = ((RSS_R - RSS_{UR})/k)/(RSS_{UR}/(n_1 + n_2 - 2k)) \qquad (2)$$

Here, RSS_R is the residual sum of squares when the regression is run for the entire time period. RSS_{UR} is the sum of the residual sums of squares obtained for the regressions run for the two sub periods separately. n_1 is the number of data points for the dependent variable in sub period 1 and n_2 is the number of data points for the dependent variable in sub period 2. Consequently, $n_1 + n_2$ is the number of data points for the dependent variable for the entire time period. k is the number of parameters estimated by running the regression. Under the null hypothesis of no structural break, the above test statistic follows F distribution with k and $(n_1 + n_2 - 2k)$ degrees of freedom in the numerator and denominator, respectively. The Chow test particulars are given in the Tables 3 and 4.

It can be inferred from the results of the Chow test that the division of the indices returns data into the time periods : January 01, 1990 - December 31, 1998 ; January 01, 1999 - December 31, 2006 ; and January 01, 2007- April 01, 2015 is justified. White test (White, 1980) is used to test for heteroskedasticity in the regression model. The 'Feasible Generalized Least Squares (FGLS)' procedure has been used to correct for heteroskedasticity, wherever detected.

Table 3. Chow Test for the Subsample Periods Jan 01, 1990 till Dec 31, 1998

	Chow Test Statistic *(F)* Calculated Value	*F* Critical Value 5% Level of Significance	*F* Critical Value 10% Level of Significance
Sensex	1.5625	1.7546	1.5474

Table 4. Chow Test for the Subsample Periods Jan 01, 1999 till Dec 31, 2006, Jan 01, 2007 till April 01, 2015

	Chow Test Statistic *(F)* Calculated Value	*F* Critical Value 5% Level of Significance	*F* Critical Value 10% Level of Significance
Sensex	1.7591	1.7546	1.5474
BSE 500	2.1487	1.7546	1.5474
BSE MidCap	2.0673	1.7554	1.5480
BSE SmallCap	1.6251	1.7554	1.5480

Table 5. Regression Results for Sensex for January 01, 1990 - December 31, 1998

	Dummy Variable Coefficients	Calculated t Statistic	Observed Significance Level
Constant	0.013	0.163	0.87
*D*2	0.501	1.724	0.085
*D*3	0.042	0.197	0.844
*D*4	0.094	0.391	0.696
*D*5	-0.121	-0.633	0.527
*D*6	0.062	0.292	0.771
*D*7	0.228	1.144	0.253
*D*8	0.195	1.001	0.317
*D*9	0.126	0.519	0.604
*D*10	-0.271	-1.264	0.207
*D*11	-0.206	-1.017	0.309
*D*12	0.064	0.289	0.773

Notes to the table:

*D_2 , D_3.... D_{12} are the dummy variables corresponding to the months February, March, April, and so on till December.

*For a daily returns observation, R_t of a given month, the dummy variable corresponding to the given month takes a value of one and the dummy variables corresponding to the other months take the value zero. January is used as the reference month.

* The constant corresponds to the reference month of January.

Table 6. Results Summary for Time Period '01/01/99 till 31/12/06'

Index	Sensex	BSE 500	BSE MidCap	BSE SmallCap
Period	01/01/99 till 31/12/06	01/02/99 till 31/12/06	01/04/03 till 31/12/06	01/04/03 till 31/12/06
'Month of the year' effect observed	November	November	November	November
Dummy Variable Coefficient for the 'month of the year' month	0.263	0.328	0.527	0.725
Observed Significance Level for the above Dummy Variable Coefficient	0.054	0.029	0.007	0.002

Results and Discussion

As can be seen from the table in the earlier section, for the period from 01/01/90 till 31/12/98, among the indices considered, price data and consequently returns data is available only for BSE Sensex. The results for Sensex after running regression equation (1) for the period January 01, 1990 - December 31, 1998 are summarized in the Table 5. It can be seen that the dummy variable coefficient for the month of February (*D*2) is positive and the only one significant at the 10% level of significance. The dummy variable coefficients for the remaining 11 months are not statistically significant at the 10% level of significance. However, the *F* statistic for the significance of the regression as a whole is statistically insignificant at the 10% level of significance. The *F* - statistic has a value of 1.498 with an observed significance level of 12.5%.

From the above regression results, we can infer that a 'February' effect is seen for Sensex for the time period January 01, 1990 - December 31, 1998. It could be recalled in this context that the graph of February returns (in Figure 1) observed earlier seemed to indicate a 'February' effect for this time period.

Table 7. Regression Results for Sensex from January 01, 1999 - December 31, 2006

	Dummy Variable Coefficients	Calculated *t* - Statistic	Observed Significance Level
Constant	0.087	1.067	0.286
*D*2	-0.008	-0.044	0.965
*D*3	-0.3	-1.237	0.216
*D*4	-0.335	-1.291	0.197
*D*5	-0.157	-0.838	0.402
*D*6	0.075	0.461	0.645
*D*7	-0.041	-0.35	0.727
*D*8	0.09	0.494	0.621
*D*9	-0.132	-0.82	0.413
*D*10	-0.126	-0.935	0.35
*D*11	0.263	1.929	0.054
*D*12	0.102	0.572	0.567

Notes to the table:

*D_2 , D_3.... D_{12} are the dummy variables corresponding to the months February, March, April, and so on till December.

*For a daily returns observation, R_t of a given month, the dummy variable corresponding to the given month takes a value of one and the dummy variables corresponding to the other months take the value zero. January is used as the reference month.

* The constant corresponds to the reference month of January.

Table 8. Regression Results for BSE 500 for February 01, 1999 - December 31, 2006

	Dummy Variable Coefficients	Calculated *t* - Statistic	Observed Significance Level
Constant	0.064	0.745	0.456
*D*2	0.062	0.291	0.771
*D*3	-0.27	-1.093	0.275
*D*4	-0.315	-1.14	0.254
*D*5	-0.103	-0.528	0.598
*D*6	0.055	0.334	0.739
*D*7	-0.029	-0.22	0.826
*D*8	0.201	1.053	0.293
*D*9	-0.11	-0.643	0.52
*D*10	-0.079	-0.593	0.553
*D*11	0.328	2.18	0.029
*D*12	0.189	0.992	0.321

Notes to the table:

*D_2 , D_3.... D_{12} are the dummy variables corresponding to the months February, March, April, and so on till December.

*For a daily returns observation, R_t of a given month, the dummy variable corresponding to the given month takes a value of one and the dummy variables corresponding to the other months take the value zero. January is used as the reference month.

* The constant corresponds to the reference month of January.

For the time period '01/01/99 till 31/12/06', the data for the indices considered is available for a part of the period or the whole of the period. The results for all the indices are summarized in the Table 6.

It can be seen that a positive 'November effect' is present in all the indices. It can be observed that the dummy variable coefficient for November (the 'month of the year' effect month for all the indices) steadily increases from Sensex to BSE SmallCap. That is, the observed 'November effect' is inversely related to size. And consequently, it can be said that the 'month of the year' effect or the November effect is stronger for small caps relative to large caps. It can be recalled in this context that the studies of Elango and Pandey (2008) and Chakrabarti and Sen (2008) both discovered a 'November' effect in the Indian market during approximately the same period - January 1999 - December 2007 in the case of the former and February 1999 - December 2006 in the case of the latter.

It can also be recalled that the graphs of Sensex and BSE 500 given earlier in this paper indicate the presence of a November effect for this time period. The results for Sensex after running regression equation (1) for the period January 01, 1999 - December 31, 2006 are summarized in the Table 7. It can be seen in the Table 7 that November ($D11$) is the only month whose dummy variable coefficient is statistically significant at both 5% and 10% levels of significance. Even the constant is not statistically significant at both 5% and 10% levels of significance. The regression equation (1) as a whole is significant at the 10% level of significance with the calculated F statistic value at 1.755 with an observed significance level of 5.7%. So, the presence of a 'November' effect can be inferred.

The results for BSE 500 after running regression equation (1) for the period February 01, 1999 - December 31, 2006 are summarized in the Table 8. It can be seen in the Table 8 that November ($D11$) is the only month whose dummy variable coefficient is statistically significant at both 5% and 10% levels of significance. Even the constant is not statistically significant at both 5% and 10% levels of significance. The regression equation (1) as a whole is significant at the 5% level of significance with the calculated F statistic value at 2.033 with an observed significance level of 2.2%. So, the presence of a 'November' effect can be inferred.

The results for BSE MidCap after running regression equation (1) for the period from March 01, 2003 - December 31, 2006 are summarized in the Table 9. The constant is not statistically significant at both 5% and 10%

Table 9. Regression Results for BSE MidCap for March 01, 2003 - December 31, 2006

	Dummy Variable Coefficients	Calculated *t* - Statistic	Observed Significance Level
Constant	-0.043	-0.312	0.755
*D*2	0.134	0.558	0.577
*D*3	0.187	0.733	0.464
*D*4	0.383	0.822	0.411
*D*5	0.067	0.179	0.858
*D*6	0.065	0.309	0.758
*D*7	0.326	1.518	0.129
*D*8	0.539	2.394	0.017
*D*9	0.301	1.403	0.161
*D*10	0.068	0.399	0.69
*D*11	0.527	2.692	0.007
*D*12	0.542	1.636	0.102

Notes to the table:

*D_2 , D_3.... D_{12} are the dummy variables corresponding to the months February, March, April, and so on till December.

*For a daily returns observation, R_t of a given month, the dummy variable corresponding to the given month takes a value of one and the dummy variables corresponding to the other months take the value zero. January is used as the reference month.

* The constant corresponds to the reference month of January.

Table 10. Regression Results for BSE SmallCap for March 01, 2003 - December 31, 2006

	Dummy Variable Coefficients	Calculated *t* - Statistic	Observed Significance Level
Constant	-0.076	-0.574	0.566
*D*2	0.13	0.461	0.645
*D*3	0.158	0.592	0.554
*D*4	0.634	1.406	0.16
*D*5	0.229	0.595	0.552
*D*6	0.157	0.612	0.541
*D*7	0.434	1.641	0.101
*D*8	0.744	2.752	0.006
*D*9	0.255	1.089	0.276
*D*10	0.079	0.362	0.717
*D*11	0.725	3.139	0.002
*D*12	0.691	1.774	0.076

Notes to the table:

*D_2 , D_3.... D_{12} are the dummy variables corresponding to the months February, March, April, and so on till December.
*For a daily returns observation, R_t of a given month, the dummy variable corresponding to the given month takes a value of one and the dummy variables corresponding to the other months take the value zero. January is used as the reference month.
* The constant corresponds to the reference month of January.

Table 11. Results Summary for Time Period '01/01/07 till 01/04/15'

Index	Sensex	BSE 500	BSE MidCap	BSE SmallCap
Period	01/01/07 till 01/04/15	01/01/07 till 01/04/15	01/01/07 till 01/04/15	01/01/07 till 01/04/15
Month of the year' effect observed	April	April	April	April
Dummy Variable Coefficient for the 'month of the year' Month	0.305	0.371	0.487	0.609
Observed Significance Level for the above Dummy Variable Coefficient	0.079	0.025	0.006	0

levels of significance. It can be seen in the Table 9 that August (*D*8) and November (*D*11) are the only months whose dummy variable coefficients are statistically significant at both 5% and 10% levels of significance. However, two aspects are worth noting. One, the observed significance level for the November coefficient is lower than that of the August coefficient. Two, the returns data for this index, that is, BSE MidCap is from March 01, 2003 while both Sensex and BSE 500 have returns data from early 1999. So, while it may seem that there is an August effect, if the data for the BSE MidCap were available from early 1999, we possibly might observe a 'November' effect.

The regression equation (1) as a whole is significant at the 10% level of significance with the calculated *F* statistic value at 1.734 with an observed significance level of 6.1%. The results for BSE SmallCap after running regression equation (1) for the period from March 01, 2003 - December 31, 2006 are summarized in the Table 10. The constant is not statistically significant at both 5% and 10% levels of significance. It can be seen in the Table 10 that August (*D*8) and November (*D*11) are the only months whose dummy variable coefficients are statistically significant at both 5% and 10% levels of significance. However, two aspects are worth noting. One, the observed significance level for the November coefficient is lower than that of the August coefficient. Two, the returns data

Table 12. Regression Results for Sensex for January 01, 2007 - April 01, 2015

	Dummy Variable Coefficients	Calculated *t* - Statistic	Observed Significance Level
Constant	-0.071	-0.609	0.543
*D*2	-0.008	-0.049	0.961
*D*3	0.151	0.911	0.363
*D*4	0.305	1.759	0.079
*D*5	0.205	1.214	0.225
*D*6	0.058	0.342	0.732
*D*7	0.185	1.111	0.267
*D*8	0.032	0.187	0.851
*D*9	0.261	1.531	0.126
*D*10	0.084	0.489	0.625
*D*11	0.023	0.135	0.893
*D*12	0.154	0.906	0.365

Notes to the table:

*D_2 , D_3.... D_{12} are the dummy variables corresponding to the months February, March, April, and so on till December.
*For a daily returns observation, R_t of a given month, the dummy variable corresponding to the given month takes a value of one and the dummy variables corresponding to the other months take the value zero. January is used as the reference month.
* The constant corresponds to the reference month of January.

Table 13. Regression Results for BSE 500 for January 01, 2007 - April 01, 2015

	Dummy Variable Coefficients	Calculated *t* - Statistic	Observed Significance Level
(Constant)	-0.098	-0.883	0.377
*D*2	0.006	0.038	0.969
*D*3	0.165	1.043	0.297
*D*4	0.371	2.237	0.025
*D*5	0.268	1.662	0.097
*D*6	0.069	0.429	0.668
*D*7	0.191	1.198	0.231
*D*8	0.06	0.372	0.71
*D*9	0.28	1.724	0.085
*D*10	0.082	0.499	0.618
*D*11	0.069	0.418	0.676
*D*12	0.232	1.429	0.153

Notes to the table:

*D_2 , D_3.... D_{12} are the dummy variables corresponding to the months February, March, April, and so on till December.
*For a daily returns observation, R_t of a given month, the dummy variable corresponding to the given month takes a value of one and the dummy variables corresponding to the other months take the value zero. January is used as the reference month.
* The constant corresponds to the reference month of January.

for this index, that is, BSE SmallCap is from March 01, 2003 while both Sensex and BSE 500 have returns data from early 1999. So, while it may seem that there is an August effect, if the data for the BSE SmallCap were available from early 1999, we possibly might observe a 'November' effect.

The regression equation (1) as a whole is significant at the 5% level of significance with the calculated *F* - statistic value at 2.129 with an observed significance level of 1.6%. The results for all the indices for the time period '01/01/07 till 01/04/15' are summarized in the Table 11. It can be observed that the dummy variable coefficient for April (the 'month of the year' effect month for all the indices) steadily increases from Sensex to BSE SmallCap. Thus, it can be said that the 'month of the year' effect or the April effect is stronger for small caps relative to large caps. It could also be recalled that the graphs of Sensex and BSE 500 given earlier in this paper indicate the presence of an 'April' effect for this time period.

The results for Sensex after running regression equation (1) for the period from January 01, 2007 - April 01, 2015 are summarized in the Table 12. It can be seen in the Table 12 that April (*D*4) is the only month whose dummy variable coefficient is statistically significant at the 10% level of significance. Even the constant is not statistically significant at both 5% and 10% levels of significance. The regression equation (1) as a whole is not statistically significant at the 10% level of significance with the calculated *F* - statistic value at 0.717 with an observed significance level of 72.4%. Thus, the presence of an 'April effect' can be inferred.

The results for BSE 500 after running regression equation (1) for the period January 01, 2007 - April 01, 2015 are summarized in the Table 13. It can be seen in the Table 13 that April (*D*4) is the only month whose dummy variable coefficient is statistically significant at the 5% level of significance while the dummy variable coefficients of May and September are significant at the 10% level of significance. The constant is not statistically significant at both 5% and 10% levels of significance. The regression equation (1) as a whole is not statistically significant at the 10% level of significance with the calculated *F* statistic value at 1.023 with an observed significance level of 42.3%. Thus, the presence of an 'April effect' can be inferred.

Table 14. Regression Results for BSE MidCap for January 01, 2007 - April 01, 2015

	Dummy Variable Coefficients	Calculated *t* - Statistic	Observed Significance Level
Constant	-0.092	-1.228	0.22
*D*2	0.015	0.093	0.926
*D*3	0.142	1.122	0.262
*D*4	0.487	2.727	0.006
*D*5	0.368	2.462	0.014
*D*6	0.099	0.654	0.513
*D*7	0.174	1.256	0.209
*D*8	0.092	0.726	0.468
*D*9	0.317	1.519	0.129
*D*10	0.027	0.17	0.865
*D*11	0.103	0.724	0.469
D12	0.362	1.789	0.074

Notes to the table:

*D_2 , D_3.... D_{12} are the dummy variables corresponding to the months February, March, April, and so on till December.

*For a daily returns observation, R_t of a given month, the dummy variable corresponding to the given month takes a value of one and the dummy variables corresponding to the other months take the value zero. January is used as the reference month.

* The constant corresponds to the reference month of January.

Table 15. Regression Results for BSE SmallCap for January 01, 2007 - April 01, 2015

	Dummy Variable Coefficients	Calculated *t* - Statistic	Observed Significance Level
Constant	-0.167	-1.558	0.119
*D*2	-0.038	-0.247	0.805
*D*3	0.103	0.671	0.502
*D*4	0.609	3.79	0
*D*5	0.396	2.534	0.011
*D*6	0.159	1.019	0.308
*D*7	0.235	1.522	0.128
*D*8	0.164	1.039	0.299
*D*9	0.303	1.919	0.055
*D*10	0.03	0.186	0.852
*D*11	0.109	0.685	0.493
D12	0.428	2.722	0.007

Notes to the table:

*D_2 , D_3.... D_{12} are the dummy variables corresponding to the months February, March, April, and so on till December.
*For a daily returns observation, R_t of a given month, the dummy variable corresponding to the given month takes a value of one and the dummy variables corresponding to the other months take the value zero. January is used as the reference month.
* The constant corresponds to the reference month of January.

The results for BSE MidCap after running regression equation (1) for the period January 01, 2007 - April 01, 2015 are summarized in the Table 14. It can be seen in the Table 14 that April (*D*4) is the only month whose dummy variable coefficient is statistically significant at the 5% level of significance, while the dummy variable coefficient of December is significant at the 10% level of significance. The constant is not statistically significant at both 5% and 10% levels of significance. The regression equation (1) as a whole is not statistically significant at the 10% level of significance with the calculated *F* - statistic value at 1.521 with an observed significance level of 11.7%. Thus, the presence of an 'April effect' can be inferred.

The results for BSE SmallCap after running regression equation (1) for the period January 01, 2007 - April 01, 2015 are summarized in the Table 15. It can be seen that the dummy variable coefficient is significant at the 5% level of significance for the months of April, May, and December. However, of these, the coefficient for the month of April is greater than that for the rest of the months. The regression equation (1) as a whole is statistically significant at the 5% level of significance with the calculated *F* statistic value at 2.848 with an observed significance level of 0.1%.

Conclusion

The purpose of this study is to examine the 'month of the year' effect in India and not necessarily the January effect. The 'month of the year' effect has been observed and studied by researchers for a very long time. Though 'the tax loss hypothesis' has been cited by some researchers as the prime reason for the January effect in the U.S.A, a significant number of researchers have disputed 'the tax loss hypothesis' for the January effect. When we consider the view that the 'the tax loss hypothesis' might not hold for the January effect, it is possible that a 'January effect' or some other 'month of the year' effect is observed in India.

There have been studies that have observed and studied the 'January effect' or the 'month of the year' effect in

India, but what distinguishes the present study from them is that the earlier studies have used indices like Nifty 50 or BSE Sensex that are constructed out of blue chip and well followed stocks. The behaviour of these indices could be very well different from midcap or small cap stocks. The obvious solution to this issue is to atleast include mid cap and small cap indices in the studies. That is what the present study does - the indices studied for the 'month of the year' effect are BSE Sensex, BSE 500, BSE MidCap, and BSE SmallCap indices.

The earlier studies seem to have ignored the fact that the Indian market has undergone tremendous transformation over the past 25 years or so. This transformation could also have impacted stock return behaviour. Raghuram (2009) reported significant changes in the asset pricing behaviour in the aftermath of the introduction of screen based trading (SBT).

The present study addresses this issue. The present study divides the past 25 years (from 1990 till the present) into three almost equal time periods and studies the 'month of the year' effect within them. The study observes that the 'month of the year' effect is different in each of the three time periods - 'February' effect for the period January 01, 1990 - December 31, 1998 ; 'November' effect for the period January 01, 1999 - December 31, 2006 ; and 'April' effect for the period January 01, 2007 - April 01, 2015. However, for a given time period, the same 'month of the year' effect is present for all the indices studied. It is also observed that the 'month of the year' effect is stronger for small caps when compared to large caps, and this finding is consistent with the results of Haug and Hirschey (2006) and Easterday et al. (2009), both of who stated that the 'month of the year' effect for the United States (or the January effect in the United States) is largely a small cap phenomenon.

The discovery of a 'November' effect in the present study for the period January 01, 1999 - December 31, 2006 might be consistent with the 'November' effect observed by Siddiqui and Narula (2013), Parikh (2009), and Yakob et al. (2005) in the Indian context as their study periods were 2000 till 2011, 1999 till 2008, and 2000 till 2005, respectively.

Research Implications, Limitations of the Study, and Scope for Further Research

The study has demonstrated that anomalies like the 'month of the year' could vary with time and so the research studies in the area of asset pricing anomalies should be structured in a way that captures this variation. The study's results indicate that the 'month of the year' effect seems to be largely a small cap phenomenon and future research could look into how much of the small cap effect is captured by the 'month of the year' effect, that is, if small cap stocks earn superior returns throughout the year or if their superior returns are concentrated in a particular month of the year (the 'month of the year' month). The study has not examined the causes for the different 'month of the year' effects in the different time periods studied, and future research could possibly explore these causes. The study also has implications for fund managers. The study suggests a possibility of maximization of returns for fund managers' funds and clients by timing of purchases or sales in a particular month of the year.

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