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Contributions to books

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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APRIL ANOMALY AND RETURN PREDICTABILITY IN INDIAN STOCK MARKET – AN EMPIRICAL STUDY

DR. V. RAJESH KUMAR

Professor of Finance and Head

Alliance School of Management

No. 2 & 3, 2nd Cross, 36th Main, Dollar Scheme, BTM 1st Stage

BANGALORE – 560 068

MS. T. S. RAVIDARSHINI

Lecturer

St. Joseph's College of Commerce

No. 163, Brigade Road

BANGALORE

ABSTRACT

This paper examines whether the 'April anomaly' or 'seasonality of monthly returns' found in several advanced markets as January Anomaly also found in the fast developing Indian markets. Most of the reasons offered for January Anomaly are applicable for the month of April in Indian Context. Any anomaly, which includes April anomaly or effect, would enable the investors and speculators to gain abnormal returns. Although the presence of April anomaly defeats the basic premises of the efficient market hypothesis, it has greater implications to design suitable investment strategies in the long run. We use the logarithmic data of the five most important indices of the National Stock Exchange of India (NSE)

for the period from April 2000 to March 2010 and apply a set of selected statistical parameters to examine the presence of anomaly, if any, in the market. Our analytical results indicate the presence of 'April anomaly' in S&P CNX Nifty which is the benchmark index of the NSE. Kruskal-Wallis test shows statistically significant differences in monthly returns in respect of three indices while Wilcoxon-Mann-Whitney test reveals statistically significant differences in the month of July, February and March when compared to April returns. Dummy Variable Regression, yet another test applied to investigate the April anomaly, also reveals statistically significant results in monthly returns. Friedman ANOVA test suggests that seasonality in stock returns is present in the case of only one index, S&P Nifty Jr. Our findings corroborate the results of previous evidences documented in the literature. Our investigation further reveals that June and July turn significant negative returns but prove to be the potential months to buy the scrips (buy low); Contrary to this, February and March show significant positive high returns goading us to conclude that these two months are the best period to sell the securities (sell high). Tax-loss selling hypothesis and Accounting-information hypothesis could be the possible explanations for the anomalous behavior of the scrips in the Indian markets. In a nutshell, our results indicate that Indian markets show evidences of seasonal anomalies and offer enormous opportunities to gain reasonable returns in the long-run.

KEY WORDS

April Effect, Market Anomalies, Seasonality, K-W test, Mann-Whitney, Friedman ANOVA, Dummy Variable Regression.

1. Introduction

An accurate predictor of share price behavior has been a topic of considerable interest among researchers and portfolio managers for several decades. Such prediction of returns defeats the basic premises of Efficient Market Hypothesis (EMH) which states that if the markets are efficient then there will be no historical patterns of returns or prices, or profitable trading strategies, to earn abnormal returns. Finance literature, of course, is replete with several instances or anomalies that are inconsistent with the EMH. January effect, Monday effect, Small-firm effect, Neglected firm effect, Low price/earning effect, Low-priced stocks, Market crashes and Market over-reactions are some of the market anomalies documented in the literature.

As stated, one such widely reported anomaly is the much hyped-up January effect or Calendar effect. To put it in simpler terms, the empirical findings on the January effect indicate that the returns for the month of January have been significantly higher when compared to the other months in a year.

The finance literature has enormous evidences provided by researchers challenging the EMH debate, with a specific focus on January anomaly. For instance, Rozeff and Felix (1983), Kinney (1976), Roll (1983), Lakonishok and Smidt, (1984); Haugen and Lakonishok, (1988), Jagadeesh (1991) have provided evidence supporting to this anomaly. Evidences of abnormal returns have been reported from the emerging markets as well. Empirical works of Aggarwal and Leal (1993), Lee (1992), Bae and Kim (1996), and Classens et al (1995) prove this phenomenon of abnormal returns in the month of January.

2. Review of Literature

As stated earlier, the Finance literature has documented evidences of various anomalies in the global securities markets in terms of a few specific days or months suggesting to the investors to go long or short

in order to gain robust returns. January effect or Turn-of-the-year effect, Turn-of-the-month effect, Day-of-the-week effect, and Holiday effect are the Calendar- related anomalies documented in the literature.

Among these, January effect is of substantial interest to the researchers and examining the same is the scope of this paper.

(a) *Explanations for January effect*

Researchers have provided several explanations for the January anomaly and a few of them are discussed below:

i. The year-end tax-loss selling hypothesis:

According to this hypothesis, investors holding a portfolio of scrips, identify the losing scrips and try to sell them in order to realize capital losses set against capital gains with a view to reduce the tax liability(e.g., Branch (1977), Dyl (1977), Schultz (1985)). Consequently, this activity triggers a downward pressure on the scrips that have witnessed a fall during the year. Contrary to this, when a new tax year begins, the bearish pressure on losing scrips starts vanishing and the share prices bounce back to equilibrium or real market price thus generating abnormal returns at the beginning of each tax year.

ii. Accounting information hypothesis:

According to this hypothesis, abnormal returns in the month of January are due to the announcements/new information provided by the firms pertaining to the previous accounting year. (e.g., Rozeff and Kinney, (1976)). When new positive information reaches the market, investors display renewed enthusiasm to buy the scrips thus pushing the prices bullish. This reportedly results in higher returns for the investors.

iii. Positive risk-return trade-off:

This theory states that in the US and Belgium there is a significant positive relationship between risk premium and average portfolio returns in the month of January. Cora *et al* (1987).

In addition to the above, the window dressing hypothesis (Haughen and Lakonishok, 1988), Ritter and Chopra (1989), turn-of-the-year liquidity hypothesis (Odgen, 1990) and bid and ask spread (Keim, 1989) are some of the possible explanations advocated in an attempt to explicate the January anomaly.

(b) ***Evidences For and Against January Anomaly***

A considerable body of researchers supports the view that January anomaly could be exploited to make abnormal returns. For instance, research studies of Gultekin and Gultelkin (1983), Lakonishok and Smidt (1984), Jagadeesh (1991) report seasonality in stock returns. They further state that stock returns are abnormally high in January compared to other months of the year. Other noteworthy studies in support of Calendar anomalies include the following. (French (1980), Gibbons and Hess (1981) Theobald and Price (1984), Jaffe and Westerfied (1985) and Board and Sutcliff (1988), Ko (1998), O.Felix Ayadi (1998)).

Quite contrary to this, a few studies argue that January anomaly of low price stocks outperforming high-price stocks cannot be used to earn abnormal returns. (Bhardwaj and Brooks (1992), Mills and Coutts (1995), Draper and Paudyal (1997), Booth and Keim (2000). They state that given the prohibitive transaction costs, lower bid-ask spread and commission, the suggested excess profit disappears. So, January anomaly cannot economically be exploited, they argue.

(c) ***Studies on Market Anomalies in the Indian Context***

Although a few research works have analyzed the different market anomalies in the Indian markets, studies on January anomaly is very limited in number. Studies by Obaidullah (1994), Choudhary (1991) on monthly and daily returns, Broca (1992) on the day-of-the-week effect, Pandey (2002) on seasonality in stock returns due to 'tax-loss-selling effect' and Sharma (2004), on the presence of the day-of-the-week effect in Indian markets are some of the prominent studies worth mentioning here. Rengasamy Elango

and Nabila (2008) analyzed the presence of Monday effect in select indices of the National Stock Exchange (NSE).

A majority of these studies have considered the closing values of the respective share price indices for analytical purposes. Indian bourses have undergone unprecedented changes, challenges and growth during the past one decade. So, it is of enormous interest to re-examine the conclusions drawn from the previous studies in view of the widening portfolio choices and methods of analysis that are available in the present day highly competitive scenario.

In India, the accounting year being April 1 – March 31, the reasons identified for January Anomaly is more suitable to the month of April. Hence, this study focuses on understanding the April Anomaly and Return predictability in Indian Stock Markets.

This study makes an attempt to examine whether India, which is one of the fast emerging markets, offers evidences of anomaly, thus ensuring abnormal returns to the investors. In a nutshell, the primary objective of this paper is to explore whether the Indian stock market is efficient in weak-form offering abnormal returns in the month of April, In addition to this, the researchers would also like to identify the specific months that yield abnormal returns to the investing population in a year. A set of selected indices of the National Stock Exchange (NSE) which is the most active stock market in India, has been taken up for the present study.

The rest of the paper is organized as follows: Section III presents an overview of the National Stock Exchange. In section IV, the data and methodology have been discussed. Section V and VI discuss the analytical results and findings of the study. Section VII presents the summary and suggests a trading rule based on the findings. The summarized results from our empirical analysis and the resulting policy implications pertaining to stock picking/selling have also been discussed. This section summarizes the conclusions of the paper as well.

3. The National Stock Exchange of India – An Overview

(a) *The Inception and the Segments*

The National Stock Exchange of India (NSE) is the world's third-largest stock exchange in terms of transactions, and covers more than 330 cities across the country and has its terminals located at 1486 locations all over India. The NSE provides access to different types of investors from all the nook and corners of India. It has registered 41.12 percent annual compound growth rate over the last decade and the trade volumes are expected to cross 10 million a day in the next few years. The National Stock Exchange of India was promoted by leading financial institutions at the behest of the Government of India, and was incorporated in November 1992 as a tax-paying company. In April 1993, it was recognized as a stock exchange under the Securities Contracts (Regulation) Act, 1956. (Source: www.nseindia.com, www.en.wikipedia.com accessed on 07.04.2010.) The NSE commenced operations in the Wholesale Debt Market (WDM) segment in June 1994. The Capital Market (Equities) segment commenced operations in November 1994 and operations in Derivatives segment commenced in June 2000. It provides nationwide screen-based automated trading system ensuring high degree of transparency and equal access to all investors which includes small investors as well. It is widely believed that the standards set by the NSE in terms of market practices, products, technology and service standards have become the benchmarks for the industry and many exchanges are replicating the practices adopted by the NSE. The NSE comprises *Wholesale Debt Market Segment*, *Capital Market Segment* and *Options and Futures Segments* and serves the expectations of a wide range of investors.

(b) *NSE - The Pioneer*

The NSE has always stood first in pioneering many innovative methods and systems in securities trading. A few of the innovative methods introduced by NSE are given below:

The NSE is the first stock exchange to introduce electronic limit order book (LOB) exchange to trade securities in India. This has helped in expediting the order processing and execution. It has also set up the first clearing corporation, the National Securities Clearing Corporation Ltd, (NSCCL) in India first. Consequently, NSCCL became a landmark in providing innovation on all spot equity market and later, derivatives market trades in India. It has also co-promoted in the setting up of National Securities Depository Limited, the first depository in India. NSE also pioneered commencement of Internet Trading in February 2000, which led to the wide popularization of the NSE in the broker community. NSE is the first and the only exchange to trade GOLD ETFs (exchange traded funds) in India. In August 2008, NSE launched Currency Derivatives, in August 2009, it launched Interest Rate Futures and in November 2009 - Mutual Fund Service System. In all these, being the first In the process.

(c) ***The Largest Technology User***

NSE is one of the largest interactive VSAT based stock exchanges in the world. Today it supports more than 3000 VSATs. The NSE- network is the largest private wide area network in the country and the first extended C- Band VSAT network in the world. Currently more than 9000 users are trading on the real time-online NSE application. There are over 15 large computer systems which include non-stop fault-tolerant computers and high-end UNIX servers, operational under one roof to support the NSE applications. This coupled with the nation wide VSAT network makes NSE the country's largest Information Technology user. A few milestones achieved by the NSE are given in Table 1.

Table 1

An Overview of NSE Operations

Settlement Guarantee Fund	31 MAR 2009	Rs.4,843.50 Cr.

Investor Protection Fund	31 DEC 2009	Rs. 307 Cr.
Number of securities available for trading	31 MAR 2010	1806
Record number of trades	19 MAY 2009	11260392
Record daily turnover (quantity)	19 MAY 2009	19225.95 Lakhs
Record daily turnover (value)	19 MAY 2009	Rs. 40151.91 Cr.
Record market capitalization	07 JAN 2008	Rs.67,45,724 Cr.
Record value of S&P CNX Nifty Index	08 JAN 2008	6357.10
Record value of CNX Nifty Junior Index	04 JAN 2008	13209.35

(Source: www.nseindia.com)

4. Data and Methodology

The present study considers the daily indices as reported by the NSE. The data employed comprise daily closing prices of the National Stock Exchange (NSE) from 1.1.2000 to 31.3.2010 covering a period of ten years in the case of four indices, and 9.25 years in case of one index. (Refer to Table 2). This study makes an attempt to examine the presence of April effect, if any, in one of the premier and most active stock exchanges in India, the NSE. In order to achieve the same the sample indices were selected applying a few logical considerations. These five indices, S&P CNX Nifty, CNX Nifty Junior, CNX

Midcap, CNXIT, and Bank Nifty form part of both the large and small indices categories of the National Stock Exchange convincing us that the dataset used fairly represent the Indian market. So, I am reasonably optimistic that the analytical results reported are realistically sufficient enough to draw meaningful conclusions about the investor behavior and share price movements. For instance, S&P CNX Nifty comprises the largest highly liquid fifty blue-chips in India representing twenty four sectors of the economy. This index represents 52% of the traded value of all the stocks in NSE. It also represents 63% of the free-float market capitalization as on 31st December 2009. (Source: www.nseindia.com) This also serves as the benchmark index for many other important purposes such as Index Funds and Stock Index-based derivatives computations. The S&P Nifty Junior has in it, the next fifty large, liquid growth stocks in India. So, these two indices make up the 100 most liquid stocks traded in the National Stock Exchange. Also, out of the seven indices for which records are maintained by the NSE, the present study covers the most active five indices. The required data for the study were downloaded from the NSE website (www.nseindia.com). The indices included for the study along with the period covered are given in Table 2.

Table 2

Sample Indices and Period of Study

Sl. No	Index	Period	No. of Observations
1	S&P CNX NIFTY	1.4.2000 TO 31.3.2010	2494
2	CNX NIFTY JUNIOR	1.4.1999 TO 31.3.2010	2494

3	CNX MIDCAP	1.1.2001 TO 31.3.2010	2306
4	CNX IT DATA	1.4.2000 TO 31.3.2010	2494
5	BANK NIFTY	1.4.2000 TO 31.3.2010	2494

Indian stock exchanges function throughout the year except on Saturdays, Sundays and other government-declared national holidays. NSE maintains a database of all the share prices sector-wise. Before computing the returns, we checked for the presence of any structural-breaks in the data. The visual inspection and the tests conducted revealed no structural breaks in the data during the study period thus encouraging us to proceed with further analysis.

a. ***Computation of monthly returns.***

The monthly share price returns on the NSE indices were computed using the first differences of the logarithmic price index. MSExcel and SPSS (Version 14) were used in data analysis. This more pragmatic approach of logarithmic transformation of time series data was first suggested by Osborne (1959). The argument put forth is that the lognormal returns tend to follow the Normal distribution more closely than arithmetic returns. (See, Lauterbach and Ungar (1995)). First, daily returns on the index is computed applying the following formulae. (See Equation 1).

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

Where, R_t is the daily mean return percent from the index, P is the price index, *t* and $_{t-1}$ represent the current and immediate preceding days. Followed by this, mean return for each month is computed applying simple arithmetic mean. (See, Equation 2).

$$R_m = \sum \frac{Rt1 + Rt2 .... Rtn}{N} \qquad (2)$$

Where, R_m is the mean return percent from the index for the respective month, R_{t1} to R_{tn} are the daily mean return percentages from the price index for the month, and *N* represents the number of observations during the month. Before computing the mean return percent for the month, the daily returns for the whole period of 10 years were checked for the presence of 'outliers', if any, in the data. In order to nullify the impact of outliers, Dixon's outlier test was applied using SPSS. It reported the ten most extreme values and the same were removed from the purview of our analysis. This preliminary data standardization helped us to avoid the presence of any extreme values or outliers in the data. So, the simple arithmetic mean percent used in the computation of monthly returns did not suffer from any abnormal or extreme values.

b. ***Computation of return seasonality***

i. *Kruskal-Wallis test*:

After the computation of daily returns, normality test was applied on the returns. Kurtosis, which forms part of the descriptive statistics gave an idea that the distributions were non-normal as in the case of most of the indices, the values were above 3 indicating peakedness (leptokurtic) of the distribution (Friedrich, 2003). Consequently, Shapiro-Wilk test for normality too confirmed that the distributions were asymmetric for the sample indices. (See, Appendix 1). With the result, K-W test, which is a non-

parametric test applied to examine whether or not the ranks of the rates of return in each month of the year are equal, is applied. The Kruskal-Wallis statistic is defined as:

$$H = \frac{12}{[N(N+1)]}\left(\frac{(\sum R_1)^2}{n_1} + \ldots\ldots + \frac{(R_k)^2}{n_k}\right) - 3(N+1) \quad (3)$$

Where,

$\sum_{R1\ldots}\sum_{Rk}$ are sums of the samples 1,2…k, n_1, n_2 …. n_k are sizes of samples 1,2…k. N is the combined number of observations for all samples. Equation 3 is distributed as a Chi-Square with (k-1) eleven degrees of freedom. The null hypothesis in this case is that the distribution of stock returns for all the months in a year is equal. The Null Hypothesis, Ho will be rejected if the computed value of the test statistic; H is more than the critical value at a chosen level of significance. (Daniel, 1990). In addition to the above test, Friedman Anova, was also applied to the daily returns obtained from the sample indices. This is also a non-parametric equivalent of One-Way Anova which identifies skewness or seasonality in the distribution. Daniel (1990), and Alford and Guffey (1996) advocate in favor of Friedman Anova over K-W test.

ii. Mann-Whitney U test:

The Mann-Whitney U test is a non-parametric test for assessing whether two samples of observations come from the same distribution. It is one of the best-known non-parametric significance tests. It was proposed initially by Wilcoxon (1945), for equal sample sizes, and extended to arbitrary sample sizes and in other ways by Mann and Whitney (1947). The null hypothesis is that the two samples are drawn from a single population, and therefore that their probability distributions are equal. It requires the two samples to be independent, and the observations to be ordinal or continuous measurements.

The Mann-Whitney "U" is then given by:

$$U_1 = R_1 - \frac{n_1(n+1)}{2} \qquad (4)$$

where n_1 is the two sample size for sample 1, and R_1 is the sum of the ranks in sample 1.

iii. Computation of April Effect Applying Dummy Variable Regression

In addition to the above non-parametric tests, in order to investigate the April effect, the following dummy variable regression equation is used.

$$R_t = \beta_1 D_{1(Apr)} + \beta_2 D_{2(May)} + \ldots.. + \beta_{12} D_{12(Mar)} + \varepsilon_t \qquad (5)$$

Where,

R_t = Index return percent in the month t;

$D_{1(Apr)}$ = dummy variable equal to 1 if t is a April and 0 otherwise,

$D_{2(May)}$ = dummy variable equal to 1 if t is a May and 0 otherwise,

.....

$D_{12(Mar)}$ = dummy variable equal to 1 if t is a March and otherwise,

$\acute{\varepsilon}_{i,t}$ = error term

The intercept, β_1 ..... $\beta_{12,}$ represent the average deviation of each month from the April return. Thus, if the monthly returns are equal, one expects the dummy variable coefficients to be statistically close to zero. So, the coefficients of the regression are the mean returns obtained from January to December applying ordinary least square (OLS). Ultimately, if NSE indices register April effect, its estimated co-efficients would be either a) higher than the returns of the other months of the year, or b) positive, which may or may not be c) statistically significant. With the result, it would, hopefully, be possible to identify a

specific trading rule in order to gain abnormal returns, particularly from the Indian markets. Again, if proved, it would be a judicious strategy to identify whether stocks could be picked up in April to capitalize on the anomaly.

5. Descriptive Statistics and Interpretation

In Table 3, we present the results of the descriptive statistics of monthly mean stock return percentage and standard deviation for all the five indices.

Table 3

Mean Monthly Return(%) and S.D for the Sample Indices

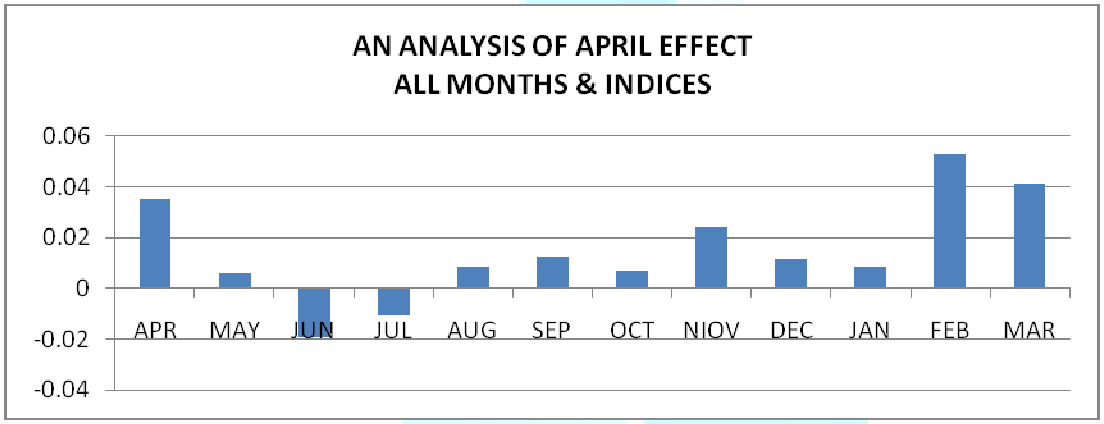
Month	Value	S&P CNX Nifty	S&P CNX Nifty Jr	CNX Midcap	CNX IT Data	Bank Nifty
APR	Mean	0.103	0.009	0.000	0.034	0.031
	S.D	0.202	0.217	0.193	0.300	0.274
	Obs	194	194	176	194	194
MAY	Mean	0.008	0.003	0.004	0.013	0.001
	S.D	0.195	0.234	0.197	0.254	0.267
	Obs	213	213	191	213	213
JUN	Mean	-0.013	-0.014	-0.020	-0.036	-0.013
	S.D	0.213	0.251	0.216	0.336	0.258
	Obs	216	216	194	216	216
	Mean	-0.019	-0.020	0.026	-0.047	0.007

JUL	S.D	0.240	0.293	0.187	0.345	0.242
	Obs	220	220	199	220	220
AUG	Mean	0.010	0.008	0.013	-0.003	0.014
	S.D	0.241	0.282	0.214	0.295	0.238
	Obs	213	213	191	213	213
SEP	Mean	0.022	0.007	0.004	0.021	0.009
	S.D	0.205	0.238	0.219	0.256	0.251
	Obs	207	207	187	207	207
OCT	Mean	0.005	0.012	0.003	-0.004	0.018
	S.D	0.182	0.193	0.167	0.269	0.218
	Obs	208	208	187	208	208
NOV	Mean	0.027	0.024	0.029	0.034	0.007
	S.D	0.157	0.177	0.156	0.213	0.189
	Obs	203	203	184	203	203
DEC	Mean	0.003	0.012	0.021	0.000	0.022
	S.D	0.211	0.217	0.181	0.287	0.230
	Obs	208	208	188	208	208
JAN	Mean	0.008	0.003	0.014	0.007	0.010
	S.D	0.206	0.226	0.159	0.282	0.218
	Obs	210	210	210	210	210
FEB	Mean	0.042	0.055	0.059	0.062	0.046
	S.D	0.162	0.173	0.140	0.221	0.194
	Obs	196	196	196	196	196
MAR	Mean	0.031	0.049	0.048	0.044	0.035
	S.D	0.162	0.204	0.170	0.245	0.213

	Obs	206	206	206	206	206
All Months	Mean	0.0189	0.0147	0.0167	0.010	0.015
	S.D	0.0317	0.023	0.022	0.032	0.016
	Obs	2494	2494	2306	2494	2494

Obs. indicates the number of observations

Figure – 1



(a) April Return – Moderately High

From the mean values of the stock returns presented in Table 3, we can understand that the return in the month of April is the highest only in the case of one index, i.e S&P CNX Nifty (mean 0.103%). (Graphical view of all the indices in Appendix-2). This is one of the benchmark indices in India and the presence of a moderately higher April return indicates that the share price behavior could be predicted by the analysts and investors. Although it is in clear violation of the efficient market hypothesis, it gives a fairly good idea of the share price movements. Although return percent in April is moderately high in S&P CNX Nifty Jr (0.009) CNX IT (0.034) and Bank Nifty (0.031), the returns are not the highest when compared to other months during the study period. Another interesting fact is that no negative returns were generated in April in respect of all the indices.

(b) June and July Yield Low Returns

An interesting finding of this study is that the month of June has registered negative returns during the study period. This could be due to several reasons. The possible reason could be that June is the month in which income-tax assessees have to file their tax returns and settle their income tax dues. So, generating the required amount is an uphill task and the investors would be bee-lining to sell the scrips to settle their dues. So, this is closely related to the tax-loss selling hypothesis discussed earlier in the literature review. However, this offers an excellent opportunity to buy stocks as the prices would be lesser compared to the other months in a year. The month of July has also recorded negative returns in the case of three important indices S&P CNX Nifty, Nifty Jr and CNX IT. So, this again might be due to tax considerations and the mandatory payment and settlement of tax dues by the assessees/investors.

(c) February and March – A Boon for the Investors

Another interesting finding from this study is that the months of February and March offer reasonably very high returns. This interesting trend could be seen in the case of all the five indices. So, logically, if investors want to sell their holdings, these two months could be considered as the best period.

6. Inferential Statistics and Discussion

(a) Analytical Results of Equality of Returns

In Table 4, we present the results of the non-parametric tests Kruskal-Wallis and Friedman rank sums test for all the five sample indices. The K-W test uses the rankings of the mean returns and tests that all monthly mean returns are equal. The analytical results indicate that returns in all months are not equal. This test has confirmed the presence of seasonality in the case of three indices as reported in Table 4. The interpretation is that in the Indian stock markets the returns are not equal in all the months of the year. In the same way, Friedman Anova, yet another non-parametric test has also been applied. According to

Alford and Guffey (1996), Friedman test is not sensitive to any possible inter-year heterogeneity in stock returns which the K-W test could not satisfy. However, Friedman suggests that seasonality in stock returns is present in the case of only one index, S&P Nifty Jr. However, the same is not true in the case of all the other indices. Overall, it could be interpreted that the KW tests have confirmed the presence of skewness or seasonality in stock returns in the stock market while the Friedman Anova has confirmed the presence of seasonality only in the case of one index during the study period.

Table 4

Results of Equality of Monthly Returns

Index	K-W Test		Friedman Rank Sums	
S&P CNX Nifty	Chi- square	15.310	Chi- square	11.615
	df	11	df	11
	P Value	0.169	P Value	0.393
S&P CNX Nifty Jr.	Chi- square	21.349	Chi- square	20.470
	df	11	df	11
	P Value	0.030**	P Value	0.039**
CNX Midcap	Chi- square	25.995	Chi- square	16.275
	df	11	df	11
	P Value	0.007***	P Value	0.131
CNX IT Data	Chi- square	27.580	Chi- square	15.030
	df	11	df	11
	P Value	0.004***	P Value	0.131
Bank Nifty	Chi- square	9.940	Chi- square	14.577
	df	11	df	11
	P Value	0.536	P Value	0.203

*Significant at 10% level **Significant at 5% level ***Significant at 1% level

(b)Analytical Results of Pair-wise Comparison of Returns.

As discussed earlier, both K-W and Friedman tests examine whether returns across the months are equal. These two tests cannot examine whether April effect is present in the Indian stock market. In order to examine the same, we apply the Wilcoxon Mann-Whitney pair-wise test. This test addresses the following question. Is the return in the month of April statistically different and significant from each of the other months during the study period? Out of the five indices analyzed (see Table 5), the results suggest that April returns are not significantly different from other months during the years. However, returns in the months of February and March are significantly different from April returns in the case of three different indices, S&P Nifty, S&P Nifty Jr and CNX Midcap. CNX Midcap has registered significantly different return in the month of July also. In the case of CNX IT, significant differences have been noticed in June and July as well. To corroborate the findings, a visual inspection of the graphs (See-Appendix 2) clearly indicates that except for one index i.e., S&P Midcap, the returns in the month of April are invariably higher in the case of all the indices. So, the month of April offers a potential opportunity for the investors to reap abnormal returns.

Table 5

Results of Wilcoxon Mann-Whitney Test

Return Pair	S&P CNX Nifty	S&P CNX Nifty Jr	CNX Midcap	CNX IT Data	Bank Nifty
APR/MAY	Z -0.165 P 0.869	Z -0.123 P 0.902	Z -0.648 P 0.517	Z -0.702 P 0.483	Z -0.483 P 0.629
APR/JUN	Z -0.878	Z -0.477	Z -0.409	Z -1.683	Z -1.229

	P 0.380	P 0.633	P 0.683	P 0.092*	P 0.219
APR/JUL	Z -0.613 P 0.869	Z -0.125 P 0.900	Z -1.870 P 0.061*	Z -2.298 P 0.022**	Z -0.377 P 0.706
APR/AUG	Z -0.691 P 0.489	Z -0.804 P 0.421	Z -1.353 P 0.176	Z -0.834 P 0.404	Z -1.167 P 0.867
APR/SEP	Z -0.804 P 0.421	Z -0.294 P 0.769	Z -0.264 P 0.792	Z -0.185 P 0.853	Z -0.355 P 0.723
APR/OCT	Z -0.206 P 0.837	Z -0.152 P 0.879	Z -0.585 P 0.558	Z -1.351 P 0.177	Z -0.271 P 0.786
APR/NOV	Z -1.241 P 0.215	Z -0.885 P 0.376	Z -1.586 P 0.113	Z -0.143 P 0.886	Z -0.624 P 0.533
APR/DEC	Z -0.626 P 0.531	Z -1.052 P 0.293	Z -1.448 P 0.148	Z -0.983 P 0.325	Z -0.538 P 0.590
APR/JAN	Z -0.082 P 0.935	Z -0.170 P 0.865	Z -0.512 P 0.609	Z -0.780 P 0.435	Z -0.434 P 0.664
APR/FEB	Z -2.026 P 0.043**	Z -2.754 P 0.006***	Z -3.132 P0.002***	Z -1.149 P 0.250	Z -1.037 P 0.300
APR/MAR	Z -1.693 P 0.090*	Z -2.589 P 0.010***	Z -2.695 P0.007***	Z -0.617 P 0.537	Z -0.715 P 0.475

*Significant at 10% level **Significant at 5% level ***Significant at 1% level

(c)Results of April Effect

In Table 6, we present the results of the 'dummy variable regression' to the daily month stock returns of the sample indices. The co-efficient β_1 is the measure of mean April returns while the other coefficients, β_2 to β_{12} represent the differences between mean returns percent from May to March. The analytical findings offer the following results. Dummy variable regression is a robust test to capture the April effect

as advocated by the financial economists in their research studies. The co-efficient in the month of April is positive invariably in respect of all the sample indices analyzed. This phenomenon is not found in any of the months and indices except for February and March. So, we can confidently conclude that there is April effect in one of the benchmark indices of the Indian bourses and the investors could capitalize on it appropriately. The results are statistically significant at 1% level in the case of two indices, i.e., CNX IT and Bank Nifty.

Table 6

January Anomaly - Results of Dummy Variable Regression Analysis

Month	Parameter	S&P CNX Nifty	CNX Nifty Jr	CNX Midcap	CNX IT	Bank Nifty
β_1 Apr (Intercept)	Coef	0.010	0.009	0.000	0.034	0.031
	Std.Err	0.015	0.017	0.015	0.020	0.018
	t-stat	0.700	0.531	-0.004	1.651	1.720
	Prob	0.484	0.596	0.997	0.099*	0.086*
β_2 May	Coef	-0.001	-0.006	0.004	-0.020	-0.030
	Std.Err	0.021	0.024	0.022	0.029	0.026
	t-stat	-0.061	-0.260	0.171	-0.701	-1.146
	Prob	0.951	0.795	0.864	0.483	0.252
β_3 Jun	Coef	-0.023	-0.022	-0.020	-0.069	-0.045
	Std.Err	0.021	0.024	0.022	0.029	0.026
	t-stat	-1.121	-0.954	-0.912	-2.404	-1.752
	Prob	0.262	0.340	0.362	0.016*	0.080*

	Coef	-0.029	-0.029	0.026	-0.082	-0.082
β_4 Jul	Std.Err	0.021	0.024	0.022	0.029	0.023
	t-stat	-1.395	-1.223	1.199	-2.779	-0.887
	Prob	0.163	0.221	0.231	0.006***	0.375
	Coef	0.000	-0.001	0.013	-0.037	-0.017
β_5 Aug	Std.Err	0.021	0.024	0.022	0.029	0.025
	t-stat	0.003	-0.024	0.590	-1.296	-1.670
	Prob	0.997	0.981	0.555	0.195	0.503
	Coef	0.012	-0.002	0.004	0.012	-0.022
β_6 Sep	Std.Err	0.020	0.023	0.021	0.028	0.025
	t-stat	0.563	-0.094	0.177	-0.434	-0.856
	Prob	0.574	0.925	0.859	0.665	0.392
	Coef	-0.005	0.004	0.003	-0.037	-0.013
β_7 Oct	Std.Err	0.020	0.023	0.021	0.028	0.025
	t-stat	-0.242	0.150	0.155	-0.316	-0.528
	Prob	0.809	0.881	0.877	0.188	0.597
	Coef	0.017	0.015	0.029	0.000	-0.024
β_8 Nov	Std.Err	0.021	0.023	0.021	0.028	0.025
	t-stat	0.834	0.652	1.353	0.014	-0.939
	Prob	0.405	0.514	0.176	0.988	0.348
	Coef	-0.007	0.003	0.021	0.033	-0.009
β_9 Dec	Std.Err	0.021	0.024	0.022	0.029	0.026
	t-stat	-0.333	0.138	0.993	-1.153	-0.340
	Prob	0.739	0.890	0.321	0.249	0.734

	Coef	-0.002	-0.006	0.014	-0.026	-0.020
β_{10} Jan	Std.Err	0.021	0.024	0.022	0.029	0.026
	t-stat	-0.103	-0.264	0.652	-0.903	-0.797
	Prob	0.918	0.792	0.515	0.367	0.426
	Coef	0.033	0.047	0.059	0.029	0.016
β_{11}Feb	Std.Err	0.021	0.024	0.022	0.029	0.026
	t-stat	1.573	1.982	2.738	0.994	0.618
	Prob	0.116	0.048*	.006***	0.320	0.537
	Coef	0.021	0.040	0.048	0.010	0.005
β_{12} Mar	Std.Err	0.021	0.024	0.022	0.029	0.026
	t-stat	1.017	1.715	2.207	2.343	0.188
	Prob	0.309	0.086*	0.027**	0.731	0.851
F		1.425	1.747	2.003	2.375	0.807
Prob		0.155	0.058*	0.025**	0.00***	0.633

*Significant at 10% level **Significant at 5% level ***Significant at 1% level

The results of K-W test have also confirmed the same in respect of the CNX IT index. Also, the results are in total conformity with the descriptive statistics presented in Table 3. Secondly, the coefficients in the case of June and July are negative for all the indices except CNX Midcap (For July) indicating that July and August are the potential periods in which returns are lower. However, it offers an excellent opportunity for the investors in picking up the right stocks as many would beeline to the market to sell their holdings. This unusual rush to sell the scrips would undoubtedly create a bearish pressure in the market thus pushing the prices down. So, potential investors could make use of this opportunity.

The next important outcome of this research is that in none of the indices, like April returns, the returns were negative for the months of February and March. This again presents an excellent opportunity for the

investors to sell their holdings as this period returns abnormal gains. These results are confirmed by descriptive statistics, K-W test and Mann-Whitney test as well thus ensuring consistency in the results.

Finally, the results discussed above goad us to frame the following trading rule in the case of NSE in particular and the Indian markets in general. "June and July are the best months to buy (buy low) and April, February and March are the best period to sell (sell high)". So, the results indicate the presence of January effect in one of the leading Indian bourses. Although some of the results are not statistically significant, a closer look at the analytical results indicate that the returns recorded in the month of January are unusually high in most of the indices analyzed. The benchmark CNX S&P Nifty, CNX IT and Bank Nifty stand testimony to the same offering higher January returns. (See Appendices-2 for a graphical view of the returns.

7. Summary and Conclusions

In this paper, we examine the January anomaly and monthly return- patterns for the five prominent indices of the National Stock Exchange of India (NSE) from seven to nine year period. The NSE provides an unique opportunity for investors to test for seasonality as many foreign players intend to enter into the Indian markets. We use the logarithmic data for all the above indices and apply a set of statistical parameters to examine the same. Our analytical results indicate the presence of seasonality and January anomaly in this market. The tests further reveal that March and April have significant negative returns but are the best months to buy the scrips (buy low) and November and December show significant positive high returns goading us to conclude that these two months are the best period to sell the securities (sell high). Tax-loss selling hypothesis and Accounting information hypothesis could be the possible explanations for the above phenomenon. Our findings corroborate the results of previous evidences documented in the literature. The Indian Markets follow the patterns/trends observed in the advanced Western markets. Although the findings violate the basic premises of the efficient market hypothesis in its

weak-form, this phenomenon could be considered as a superior opportunity for the investors to earn reasonable returns from the market.

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Appendix 1

Results of Shapiro-Wilk Tests of Normality

Month	Value	S&P CNX Nifty	S&P CNX Nifty Jr	CNX Midcap	CNX IT Data	Bank Nifty
APR	P Value	0.531	0.017*	0.000***	0.614	0.055*
	Obs.	194	194	176	194	194
MAY	P Value	0.023**	0.001***	0.000***	0.002***	0.061*
	Obs.	213	213	191	213	213
JUN	P Value	0.663	0.001***	0.000***	0.000***	0.005***
	Obs.	216	216	194	216	216
JUL	P Value	0.000***	0.000***	0.000***	0.008***	0.002***
	Obs.	220	220	220	220	220
AUG	P Value	0.000***	0.000***	0.000***	0.000***	0.000***
	Obs.	213	213	191	213	213
SEP	P Value	0.088*	0.000***	0.000***	0.001***	0.096
	Obs.	207	207	187	207	207
OCT	P Value	0.000***	0.276	0.000***	0.000***	0.007**
	Obs.	208	208	187	208	208
NOV	P Value	0.011***	0.003***	0.000***	0.011***	0.002***
	Obs.	203	203	181	203	203
DEC	P Value	0.000***	0.000***	0.000***	0.000***	0.000***
	Obs.	208	208	188	208	208

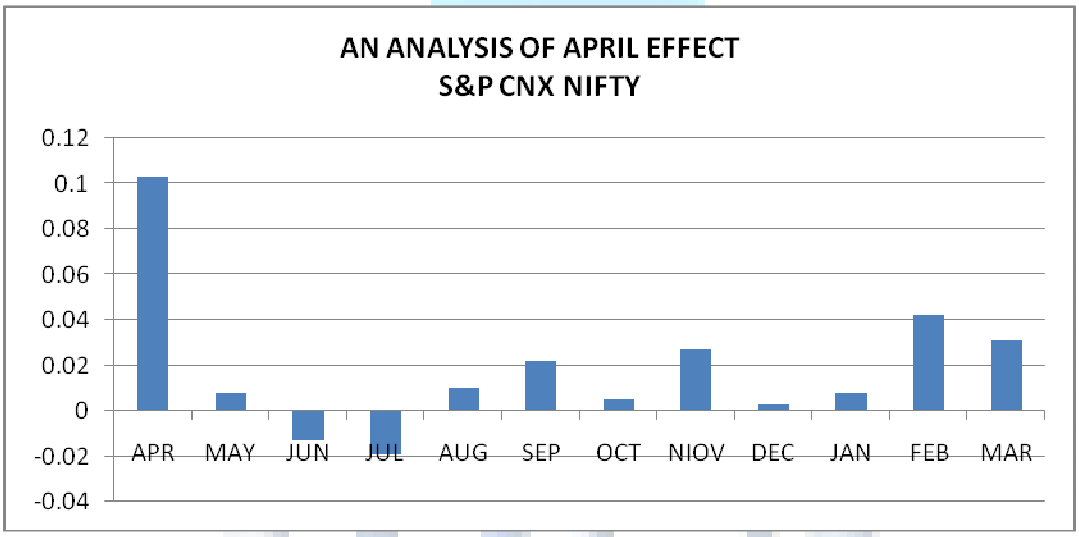
JAN	P Value	0.130	0.005***	0.808***	0.012***	0.726
	Obs.	210	210	210	210	210
FEB	P Value	0.003***	0.000***	0.010***	0.000***	0.810
	Obs.	196	196	196	196	196
MAR	P Value	0.004***	0.000***	0.000***	0.009***	0.033**
	Obs.	206	206	206	206	206

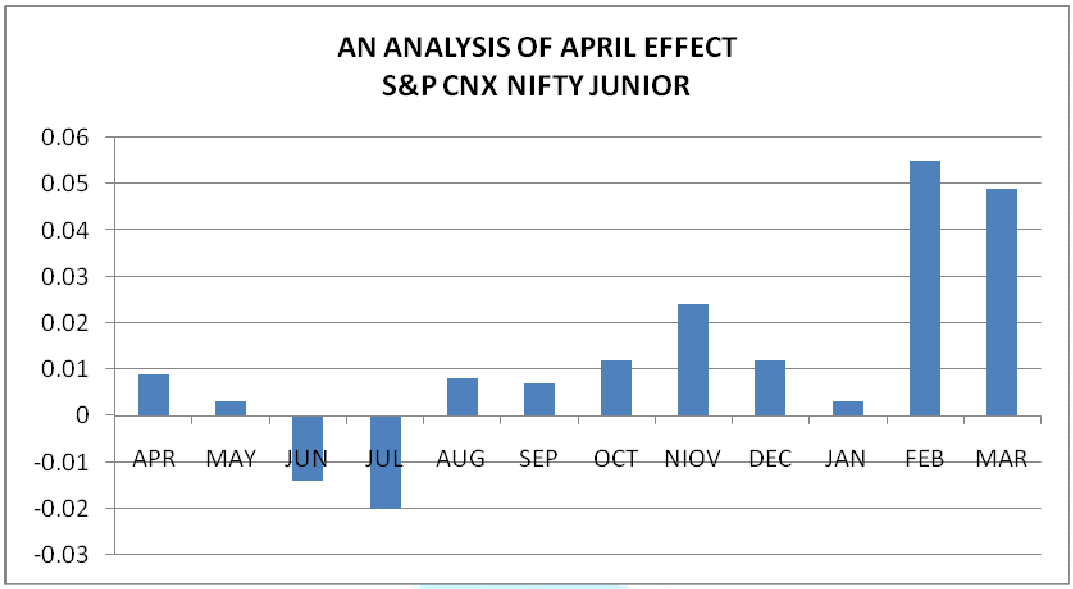
***indicates significance at 1% level

**indicates significance at 5% level

*indicates significance at 10% level

Appendices 2

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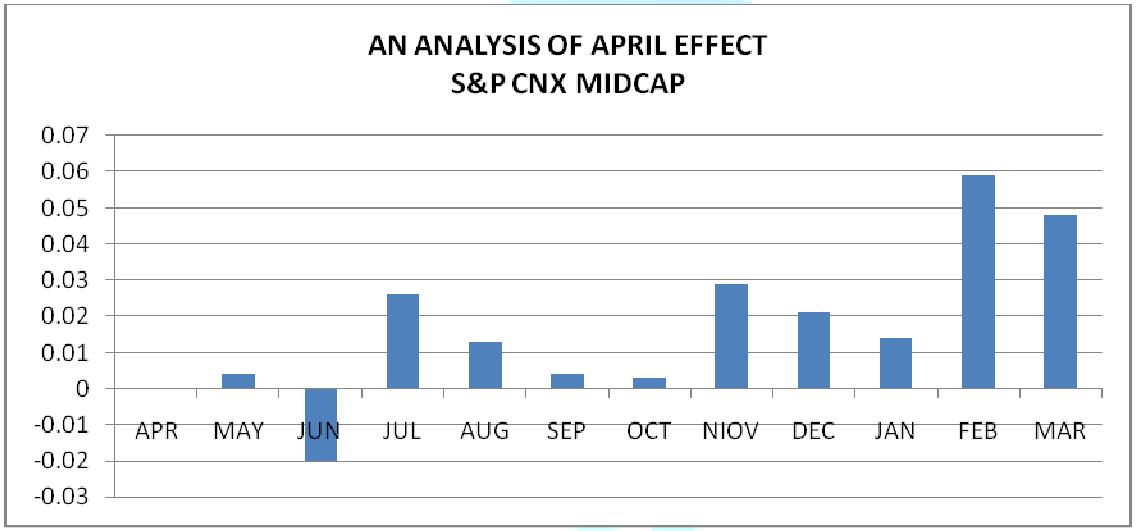
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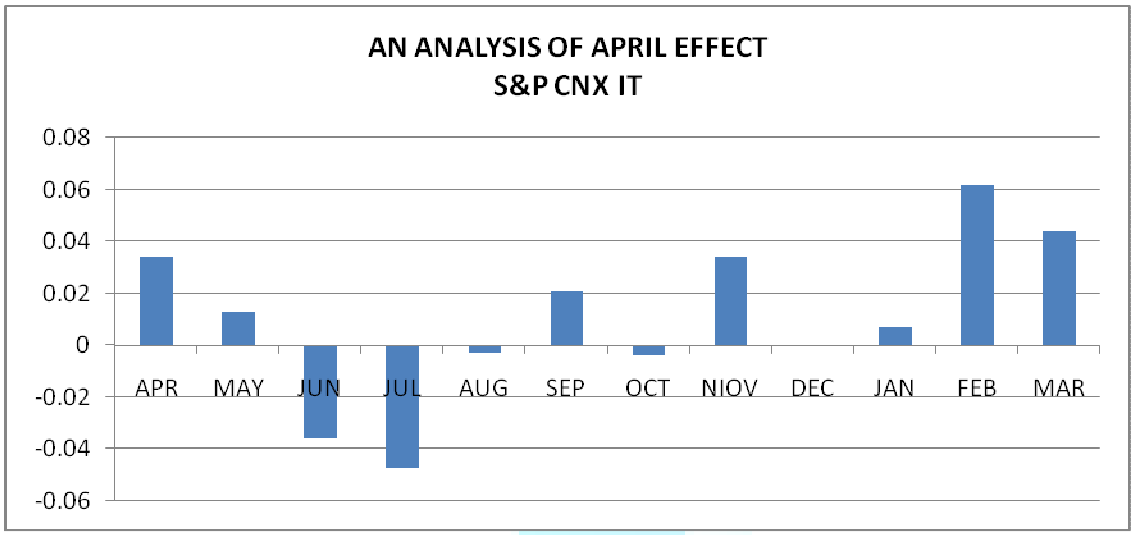
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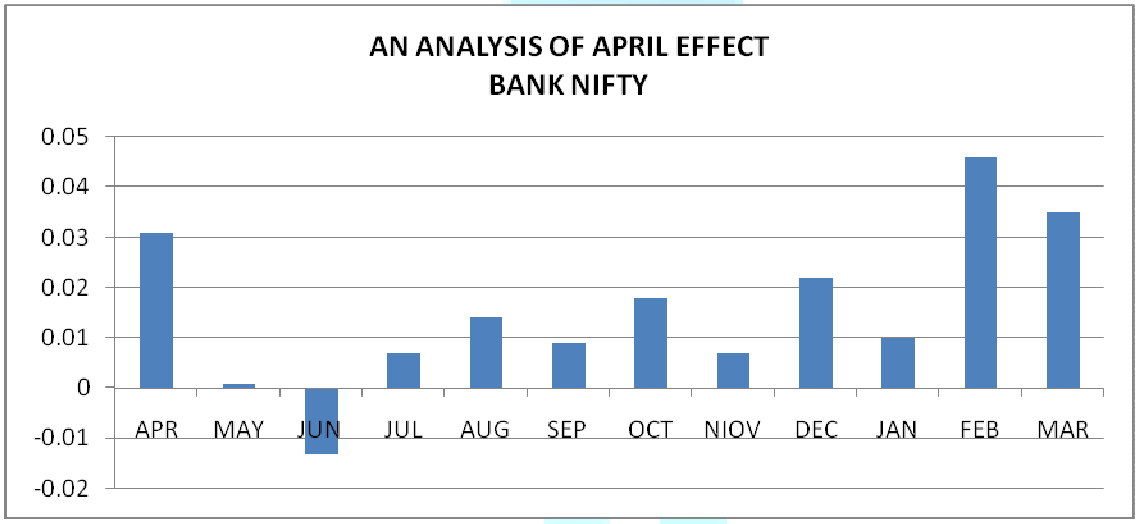
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NIOV
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JAN
FEB
MAR