INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN 2278 – 0211 (Online)

An Empirical Analysis of January Effect – Evidence from Indian Market

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Abstract:
This paper investigates calendar anomalies in stock returns which occur due to deviation in normal behaviors of stocks with respect to time periods. The anomaly under study is one of the most common calendar anomaly detected in various International markets, the January effect. The research used secondary data from the stock market. The empirical research is conducted using daily logarithmic percentage returns of the S&P CNX Nifty. It is taken as a proxy of National Stock Exchange because it represents about 66.17% of the free float market capitalization of the stocks listed on NSE as on March 31, 2015. The data is taken over a period of twelve years (April 2002 – March 2014) and divided into two equal sub-periods, one from April 2002 – March 2008 as sub-period I& other from April 2008 – March 2014 as sub-period II, to take the impact of the crisis into account and to check the robustness of the results. Analysis part contains descriptive statistics of the variables, graphical representation of means of variables, cross-correlation among the variables, unit root test to check the stationarity of time series data for the applicability of a regression model. A regression model using dummy variables is run to test the presence of these seasonal effects as used by NPR Deyshappriya in his paper in all the above mentioned three periods separately, but the results provide no support for the existence of January effect in the Indian Stock returns except significant negative October effect in sub-period II.

Keywords: *January effect, CNX Nifty Index, daily returns, correlation, multiple regressions.*

1. Introduction

1.1. Background of the Study

During the development of Indian stock exchange market, researchers have tried to find out whether the Indian stock market is efficient or not and they found some evidences of inefficiencies [1]. Now, if there are market inefficiencies then there must exist some market anomalies, through which investors can gain some abnormal returns by using well planned strategies within the market. There are many observed market movements that are not explained by the arguments of the efficient market hypothesis. In the standard finance theory, such market movements that are inconsistent with the efficient market hypothesis are called anomalies (Bostanci,2003). Thus the market efficiency anomalies contradict efficient market hypothesis (EMH) because EMH proposes that it is not possible to outperform the market through market timing or stock selection (Mokua, 2003). A market theory that evolved from a 1960's Ph.D. dissertation by Eugene Fama, the efficient market hypothesis states that at any given time and in a liquid market, security prices fully reflect all available information [2]. Stock market anomalies could be fundamental, technical or calendar related. Fundamental anomalies include value effect, small-cap effect (low P/E stocks and small cap companies do better than index on an average) and the Low-volatility anomaly. Calendar anomalies involve patterns in stock returns from year to year or month to month, while technical anomalies include momentum effect [3].

This paper will investigate only about the existence of January effect of calendar anomalies. However, in the context of financial markets and particularly in the case of equity market seasonal component have been recorded. They are called calendar anomalies. The existence of the calendar anomalies is a denial of the weak form of EMH which states that stock returns are time invariant which means that there is no short-term seasonal pattern in the stock returns. The existence of seasonal pattern in the stock return infers that a market is inefficient and investors should be able to earn abnormal return. That's why finance researchers have been interested to find out the existence of the calendar anomalies or seasonality in the stock returns in different markets. The most important calendar effects

[1] Misra,V., Mishra,A.K., & Rastogi,S. (2012), Testing efficient capital market model in Indian Subcontinent.
[2] http://www.morningstar.com/InvGlossary/efficient_market_hypothesis_definition_what_is.aspx Retrieved on 10.08.15
[3] https://en.wikipedia.org/wiki/Market_anomaly, Retrieved on 10.08.2015

studied are the day-of-the-week effect (significantly different returns on some day of the week; usually higher Friday returns and lower Monday returns), the January effect (relatively higher January returns), the turn-of-the month effect (returns higher over the first fortnight of the month) and the holiday effect (returns higher on the days before holidays). These market anomalies, if detected, are proofs of market inefficiencies [4].

This paper is concerned with one of the most common anomalies found on different stock markets of the world, and tries to test the presence of the above mentioned calendar effect i.e, January effect, on National Stock Exchange.

In terms of the January effect, the positive January effect has been observed by the most researchers. According to them, the average return in January is higher than any other month of the year.

The main reason for this is the most of the investor in International markets used to sell shares in December in order to show the capital losses to avoid paying taxes. However, they reinvest the money in the stock market in the next January once the tax calendar starts from January [5].

The rest part of this paper has addressed the objectives, the significance of the study, hypotheses and the detailed analysis of January effect followed by the summary, conclusion & limitations.

1.2. Research Objective

The main objective of the study is to examine the existence of January effect/Month-of-the-Year effect on stock returns in the National Stock Exchange of Indian stock market.

1.3. Hypotheses of the Study

The following Null Hypotheses were developed and will be tested.

Objective: To test the January Effect (Month-of-the-Year Effect) in the Indian Stock Market

- Null Hypotheses:
- → NH1: There is no significant relationship among the returns of January and different months of the year.
- → NH2: There is a unit root for the series.
- → NH3: There is no significant difference between the average daily return of January with that of all the other months of the year.

1.4. Significance of the Study

Anomalies are some re-occurring predictions whose study can be useful to investors and brokers for their selection and decision of transaction. Investors seek for predictions in the market [6]. The study of market anomaly like existence of the day of the week effect and January effect has been more commonly addressed in the context of developed market such as USA, Japan, Canada and Australia. In addition, some of the emerging markets situations such as Singapore, Malaysia and have been also documented by Aggrawal & Rivoli (1989), Brooks & Persand (2001) and Padma (2011). However, there are very few studies reported on market anomalies in Indian stock market by Kaur (2004), Golak Nath and Dalvi, (2004), Kumari & Mahendra (2006), Bodla and Jindal (2006), Choudhary and investorsin fact, the stock market in India is now expanding its branches all over the world. Therefore, the results will show an avenue to new and existing investors to maximize their returns on investment by developing certain investment strategies within the market to beat the market to gain some abnormal to make their buying and selling decisions more rationally and efficiently [7].

returns and give an opportunity to check the existence of market anomalies in the Indian market as well as it is an opportunity to test the existence of Efficient Market Hypothesis in Indian Stock Market.

2. Literature Review - Empirical Evidences on January Effect

Generally termed as the *January effect* (also known as the *turn-of-the-year effect* or the *January anomaly*) is the most important calendar anomaly. The returns on common stocks in January are much higher than in other months, and this phenomenon is due to smaller-capitalization stocks in the early days of the months [8].

[4] Tudor Christiana (2006), Testing for seasonal anomalies in the Romanian Stock Market

[5] Deyshappriya, N.P. (2014), An empirical investigation on stock market anomalies: The evidence from Colombo stock exchange in Srilanka, pg. no. 178.

[6] Safeer, M., & Kevin, S. (2014). A study on market anomalies in Indian stock market. Int. J. Bus. Admin. Res. Rev, pgno. 132

[7] Deyshappriya, N. R. (2014). An Empirical Investigation on Stock Market Anomalies: The Evidence from Colombo Stock Exchange in Sri Lanka.International Journal of Economics and Finance, 6(3), p178

[8] http://calendar-effects.behaviouralfinance.net/january-effect/ retrieved on 12.08.2015

No	Author	Data	Period	Findings
1.	Rozeff and Kinney (1976)	New york Stock Exchange	1904-1974	Found January effect (Higher returns than others months)
2.	Gultekin and Gultekin (1983)	Sixteen Industrial Countries		Higher January returns in fifteen of sixteen countries.
3.	Khaksari and Bubnys (1992)	1. S & P 500 (US 2. NYSE Stock in	1982-1988	Monthly effect is present.
4.	Raj and Thurston (1994)	NZ stock market	-	January and April effects are not statistically significant.
5.	Husain (1998)	Pakistan stock market	Ramadhan effect	Decline in stock returns volatility in this month although the mean return indicates no significant change.
6.	Fountas and Segredakis (2002)	18 Stock markets	-	Reported seasonal patterns in returns.
7.	Pandey (2002)	BSE Sensitivity Index (India)	1991-2002	Maximum positive trading returns are found in Feb and lowest (negative) in Mar.
8.	Bodla and Jindal (2006)	S & P CNX Nifty (India)	1998-2005	Not found any significant differences among individual months.
9.	Ash Narayan Sah (2009)	S & P CNX Nifty	2005-2008	Statistically significant returns in July, September, December and January.

Table 1

Source: http://hdl.handle.net/10603/4863, http://hdl.handle.net/10603/4863, www.scholar.google.co.in& various research studies.

3. Testing of January Effect/Month-of-the-Year Effect in the Indian Stock Market

One of the most common seasonal anomalies is the January effect. This analysis is based on the hypothesis that the yields produced by each security are not independent of the months of the year.

3.1. Data & Methodology

The research used secondary data from the stock market. The empirical research is conducted using daily logarithmic percentage returns of the S& P CNX Nifty are employed to investigate the January effect in the Indian Stock Exchange. It is taken as a proxy of National Stock Exchange because it represents about 66.17% of the free float market capitalization of the stocks listed on NSE as on March 31, 2015. We consider a twelve years' period (April 2002 – March 2014), or a total of 2809 daily observations which is converted into 2808 observations through return formula., which will be further divided into two sub samples with an equal number of periods before and after subprime crisis, in order to find any possible changes due to subprime crisisand to check the robustness of the results. In this way, the first sub-sample have 1405 daily observations which is converted into 1404 observations through return formula, covering the period from April 2002 till March 2008 and the second sub-sample
would contain the remaining 1381 daily observations which is converted into 1380 observations through return formula, covering the period from April 2008 till March 2014. In this case, the data is categorized into different months of the year from January to December respectively in all periods. The data is taken from the website of NSE[9].
The following methodology has been used to check the January effect.

3.1.1. Returns

$R_t = (LnP_t – LnP_{t-1})* \quad 100$ (1)

Where:
R_t is the return in the period t;
P_t is the daily closing share price index at a particular time t;
P_{t-1} is the daily closing share price index for the preceding period;
Ln is the natural logarithm

3.1.2. Descriptive Statistics

Under Descriptive Statistics,
1) Average Daily Returns (mean),
2) Graphical Representation
3) Standard Deviation
4) Skewness
5) Kurtosis and
6) Normality test

[9] http://www.nseindia.com/products/content/equities/indices/historical_index_data.htm, retrieved on 12.08.2015

3.1.3. Cross Correlation

Cross Correlation is a standard method of estimating the degree to which two series are correlated. This is for following null hypothesis that "There is no significant relationship among the returns of different months of a year".

3.1.4. Unit Root Test

Since the study is dealing with time series data, it is essential to check the stationarity of the variables in order to avoid the spurious regression. Hence, Augmented Dickey Fuller (ADF) test (Dickey and Fuller, 1981) were used to measure the stationarity of month wise daily average returns of all sample indices. A Unit Root Test examines whether a time series variable is non-stationary by using an autoregressive model. The theoretical background of the ADF test has been explained using the following model.

$$\Delta Y_{it}=\alpha_{0i}+\theta_i Y_{it-1}+\alpha_{i1}+\sum_{j=1}^{p}\delta_{ij}\,\Delta Y_{it-j}+\varepsilon_t \qquad (2)$$

$$\Delta Y_{it} = \alpha_{0i} + \theta_i Y_{it-1} + \sum_{j=1}^{p}\delta_{ij}\,\Delta Y_{it-j} + \varepsilon_t \qquad (3)$$

According to the theoretical view that has been stated in the above equations, $Y_{it}$is the any time series variable of *i*–th country for time period *t*. Further, $\Delta Y_{it} = Y_{it} - Y_{it-1}$and the *t* is the time trend term and $\alpha_{0i}$is the constant.*P* is the number of lagged terms and$\varepsilon_t$is the error term which is white noise. According to the above model, the hypothesis can be expressed as follows.

$H_o : \theta_1 = 0$

$H_1 = \theta_1 < 0$

The null hypothesis explains the series is non-stationary or the there is a unit root problem while the alternative hypothesis indicates the series is stationary and no unit root problem exists. If the null hypothesis is rejected, it means $Y_t$is stationary and it is known as *I(0)* variable. If the series is non-stationary, then the series should be differenced and tested for higher integration [10].

3.1.5. Ordinary Least Squared (OLS) Regression for January Effect

In order to examine the January effect for the Index, the regression analysis based on OLS technique was utilized inaccordance with Gibbons and Hess (1981), Ajay et al. (2004), Lian and Chen (2004). Also Brooks (2002, 537-539) suggests that this is the basic method for studying calendar anomalies. The

regression equation includes an intercept and 11 dummy variables, one for each of thefirst elevenmonths of the year. Since, the eleven dummy variables were used, the intercept term was purposely omitted to avoid the perfect co-linearity of the model. The equation that we estimate is:

$$R_t = b_o + b_1 Jan_t + b_2 Feb_t + b_3 Mar_t + \text{----------} + b_{11} Nov_t + u_t \qquad (4)$$

Where each month dummy variable has a value of 1 when the month occurs and a value of 0 for the other months. The intercept, b_o in our equation, measures the average log percentage return of the Index for December, where each b_i of the estimated OLS coefficients for the dummy variables shows the estimated difference between returns in that month and returns on December and u_t is the error term.

The same regression has been used for whole sample period, Sub-period I and Sub-period II. The F-test can be used to test the presence of January effect based on the following hypothesis.

H_0: $b_1 = b_2 = b_3 = b_4 =$ ----------$= b_{11} = (0)$;

H_1: At least one of the coefficients is not equal to another coefficient.

According to null hypothesis, average returns of January are significantly higher than the other months of the year. Therefore, if the null hypothesis can be rejected through the significant F-test; it indicates the existence of January effect [11].

4. Results & Discussion

4.1. Results & Discussion of Descriptive Analysis of S&P CNX Nifty Daily Returns Month wise

The Results of Descriptive Statistics of S&P CNX Nifty for (the whole study period) from April 2002 to March 2014, (Sub-period I) from April 2002 to March 2008 & (Sub-period II) from April 2008 – March 2014 are presented in **Table-2**.

4.1.1. Whole Period

Return of whole period combined is leptokurtic & negatively skewed (Table no. 2). It is understood that the S&P CNX Nifty Index earned maximum daily mean returns of **0.211** in September, with a Standard Deviation of **1.366**and the lowest mean return (**0.113)** was recorded in January. This indicates that the share price might have been low in January and high in September. Hence investors are advised to buy the shares in January and sell them on September. The Highest Value for Standard Deviation **2.134** was recorded in May and the least Value of Standard Deviation **1.268** was recorded in December. This clearly indicates that the Stock Market was more volatile in May and least volatile in December during the study period. The value of coefficient of Jarque Bera was significant at five percent level of significance for all trading months. This implies that the returns were asymmetric and did not conform to normal distribution during the study period.

[10] Deyshappriya, N. R. (2014). An Empirical Investigation on Stock Market Anomalies: The Evidence from Colombo Stock Exchange in Sri Lanka. International Journal of Economics and Finance, 6(3), p179.

[11] Agrawal, A., & Tandon, K. (1994). Anomalies or illusions? Evidence from stock markets in eighteen countries. Journal of international Money and Finance,13(1), pg no. 86, retrieved on 14.08.2015

4.1.2. Sub-period I

Return of Sub-period I as a whole is leptokurtic & negatively skewed (Table no. 2). It is understood that the S&P CNX Nifty Index earned maximum daily mean returns of **0.302** in November, with a minimum Standard Deviation of **1.079** and the lowest mean return **(0.151)** was recorded in January. This indicates that the share price might have been low in January and high in November. Hence investors are advised to buy the shares in January and sell them in November. The Highest Value for Standard Deviation **2.250** was recorded on May and the least Value of Standard Deviation **1.268** was recorded in November. This clearly indicates that the Stock Market was more volatile in May and least volatile in November during the study period. The value of coefficient of Jarque Bera was significant at five percent level of significance for all trading months. This implies that the returns were asymmetric and did not conform to normal distribution during the study period.

4.1.3. For Sub-period II

Return of sub-period II is leptokurtic & positively skewed (Table no. 2). It is understood that the S&P CNX Nifty Index earned maximum daily mean returns of **0.477** in March followed by April, with a Standard Deviation of **0.313**and the lowest mean return **(0.368)** was recorded in October. This indicates that the share price might have been low in October and high in March & April. Hence investors are advised to buy the shares in October and sell them in March or April. The Highest Value for Standard Deviation **3.608** was recorded in October and the least Value of Standard Deviation **1.733**was recorded in February. This clearly indicates that the Stock Market was more volatile in October and least volatile in February during the study period. The value of coefficient of Jarque Bera is significant at five percent level of significance for all trading months except June, August & September. This implies that the returns were asymmetric and did not conform to normal distribution during the study period.

Periods	Variables	No.	Mean	Variance	S. D	Skew	Kurt	S. E	JB (obser)	P-Value
April 2002 - March 2014	**All Months**	2991	0.059	2.467	1.571	-0.240	9.304	0.029	10817.7	<0.0001
	January	253	**-0.113**	2.779	1.667	-0.511	5.247	0.105	301.7	<0.0001
	February	253	-0.027	1.843	1.358	-0.338	1.921	0.089	40.60	<0.0001
	March	253	0.072	2.292	1.514	-0.355	2.145	0.098	25.53	<0.0001
	April	253	0.094	1.992	1.411	-0.277	1.517	0.092	25.53	<0.0001
	May	253	-0.037	**4.554**	**2.134**	**0.699**	**19.270**	0.134	4061.1	<0.0001
	June	253	0.039	2.420	1.556	-0.062	1.387	0.098	19.58	<0.0001
	July	253	0.107	2.267	1.506	-0.210	2.028	0.095	48.58	<0.0001
	August	253	0.062	1.788	1.337	-0.447	**1.136**	0.084	22.40	<0.0001
	September	253	**0.211**	1.865	1.366	-0.186	1.458	0.087	23.47	<0.0001
	October	253	-0.006	3.817	1.954	**-1.141**	9.190	0.124	926.6	<0.0001
	November	253	0.121	2.295	1.515	-0.158	3.331	0.098	112.86	<0.0001
	December	253	0.204	**1.608**	**1.268**	0.081	1.949	0.080	40.33	<0.0001
April 2002 - March 2008	**All Months**	1505	0.098	2.344	1.531	-0.834	6.926	0.039	3182.43	<0.0001
	January	126	**-0.151**	3.598	1.897	-0.407	5.033	0.170	136.45	<0.0001
	February	126	-0.007	2.210	1.487	-0.188	2.165	0.138	23.53	<0.0001
	March	126	-0.078	2.812	1.677	-0.426	1.843	0.153	20.80	<0.0001
	April	126	-0.005	2.150	1.466	-0.478	1.377	0.134	14.05	<0.0001
	May	126	-0.145	5.063	**2.250**	-1.853	10.001	0.201	635.97	<0.0001
	June	126	0.185	2.724	1.650	0.102	1.939	0.148	23.21	<0.0001
	July	126	0.111	1.507	1.228	-0.464	0.415	0.110	9.31	<0.0001
	August	126	0.201	1.616	1.271	-0.684	1.863	0.114	30.91	<0.0001
	September	126	0.252	1.381	1.175	-0.350	1.815	0.105	19.86	<0.0001
	October	126	0.171	2.280	1.510	0.458	0.978	0.135	9.41	<0.0001
	November	126	**0.302**	1.165	**1.079**	-0.215	1.935	0.098	20.15	<0.0001
	December	126	0.298	1.377	1.173	-0.836	2.586	0.105	51.50	<0.0001
April 2008 - March 2014	**All Months**	1486	0.047	5.460	2.337	0.065	**8.544**	0.061	4520.76	<0.0001
	January	127	-0.237	4.098	2.024	-0.733	2.169	0.180	36.25	<0.0001
	February	127	-0.033	3.002	**1.733**	-0.292	1.370	0.160	10.90	<0.0001
	March	127	**0.477**	3.224	1.795	0.313	1.005	0.164	7.06	<0.0001
	April	127	0.476	3.637	1.907	1.121	3.140	0.179	71.33	<0.0001
	May	127	0.042	8.246	2.872	3.544	18.852	0.256	2141.23	<0.0001
	June	127	-0.200	4.598	2.144	-0.440	0.578	0.191	5.28	**0.071**
	July	127	0.310	5.137	2.266	0.409	1.050	0.202	11.45	<0.0001
	August	127	-0.209	4.058	2.015	-0.166	-0.065	0.181	0.599	**0.741**
	September	127	0.332	5.221	2.285	-0.423	0.336	0.207	4.23	**0.120**
	October	127	-0.368	13.015	**3.608**	-1.331	6.312	0.328	238.55	<0.0001
	November	127	-0.129	6.683	2.585	-0.117	2.899	0.238	41.94	<0.0001
	December	127	0.215	3.589	1.895	0.529	1.728	0.169	21.54	<0.0001

Table 2: Descriptive Analysis of S&P CNX Nifty Index Daily Returns Month wise
Source: Computed from XL Stat & Minitab

4.2. Graphical Representation Month wise- Results & Discussion

- Fig.1 clearly displays the average mean returns for S&P Nifty Index from April 2002 to March 2014. The highest mean return was earned in September and the lowest on January during the study period.
- Fig.2clearly displays the average mean returns for S&P Nifty Index from April 2002 to March 2008. The highest mean return was earned in November and the lowest in January during the study period.
- Fig.3clearly displays the average mean return for S&P CNX Nifty Index from April 2008 to March 2014.The highest mean return was earned in March and the lowest in October during the study period.

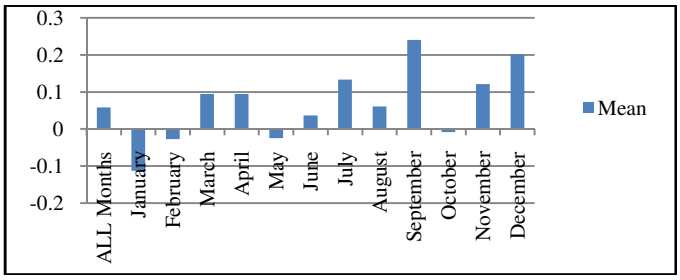

Figure 1: Average Returns of Trading Months of the Year for S&P CNX Nifty Index Daily Returns from April 2002 to March 2014

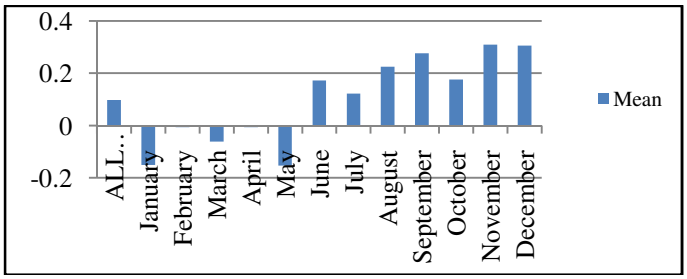

Figure 2: Average Returns of Trading Months of the Year for S&P CNX Nifty Index Daily Returns from April 2002 to March 2008

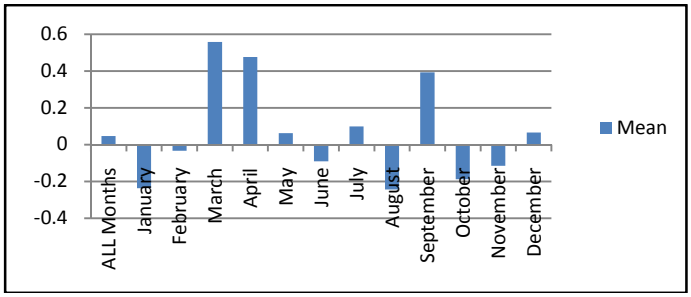

Figure 3: Average Returns of Trading Months of the Year for S&P CNX Nifty Index Daily Returns from April 2008 to March 2014
Source: Computed from Table 7

4.3. Cross Correlation Test of S&P CNX Nifty Index Month wise

- Null Hypothesis, NH1: There is no significant relationship among the returns of different months of the year.

5. Results & Discussion

a) Whole period (Table-3) shows the results of Cross Correlation Test for S&P CNX Nifty Index for the period from April 2002 to March 2014. From this, it is observed that there was no significant relationship between the returns of other trading months of the year. Hence the Null Hypothesis (NH1), "There is no significant relationship between the returns of different trading months of the year," is almost accepted. Highest positive correlation is found out between October & July i.e. 0.258.

b) Sub- period I (Table-4) shows the results of Cross Correlation Test for S&P CNX Nifty Index for the period from April 2002 to March 2008. From this, it is observed that there was no significant relationship between the returns of other trading months of the year. Hence the Null Hypothesis (NH1), "There is no significant relationship between the returns of different trading months of the year," is almost accepted. Highest positive correlation is found out between December & Feb i.e. 0.26.

c) Sub- period II (Table-5) shows the results of Cross Correlation Test for S&P CNX Nifty Index for the period from April 2008 to March 2014. From this, it is observed that there was no significant relationship between the returns of other trading months of the year. Hence the Null Hypothesis (NH1), "There is no significant relationship between the returns of different trading months of the year," is almost accepted. Highest positive correlation is found out between September & Nov i.e. 0.36.

Months		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	Pearson Corr.	1											
Jan	**P- Value**	0											
	Pearson Corr.	0.124	1										
Feb	**P- Value**	0.057	0										
	Pearson Corr.	-0.017	-0.028	1									
Mar	**P- Value**	0.770	0.665	0									
	Pearson Corr.	0.066	-0.004	0.011	1								
Apr	**P- Value**	0.313	0.951	0.864	0								
	Pearson Corr.	-0.091	0.079	0.007	0.028	1							
May	**P- Value**	0.126	0.225	0.948	0.672	0							
	Pearson Corr.	0.015	0.164	-0.04	-0.09	0.020	1						
June	**P- Value**	0.767	**0.012**	0.488	0.152	0.714	0						
	Pearson Corr.	0.017	0.152	-0.01	-0.003	-0.04	-0.181	1					
July	**P- Value**	0.738	**0.019**	0.762	0.965	0.582	**0.005**	0					
	Pearson Corr.	0.140	0.094	0.022	0.031	-0.01	0.036	-0.02	1				
Aug	**P- Value**	**0.009**	0.149	0.683	0.633	0.859	0.605	0.593	0				
	Pearson Corr.	-0.125	-0.030	-0.06	0.025	-0.04	0.073	-0.02	-0.03	1			
Sept	**P- Value**	**0.033**	0.642	0.309	0.704	0.436	0.228	0.701	0.359	0			
	Pearson Corr.	0.090	0.151	-0.16	-0.035	-0.01	-0.064	0.258	0.022	-0.04	1		
Oct	**P- Value**	0.190	**0.020**	**0.015**	0.592	0.848	0.350	**0.000**	0.764	0.504	0		
	Pearson Corr.	0.057	-0.064	-0.00	-0.111	-0.058	-0.045	0.038	0.003	0.151	-0.01	1	
Nov	**P- Value**	0.355	0.326	0.880	0.091	0.330	0.411	0.671	0.955	**0.026**	0.918	0	
	Pearson Corr.	-0.050	0.188	-0.10	0.082	0.024	0.038	0.013	0.015	-0.04	0.083	-0.11	1
Dec	**P- Value**	0.454	**0.004**	0.12	0.211	0.745	0.631	0.654	0.46	0.507	0.164	0.085	0

Table 3: The Results of Correlation Test for S&P CNX Nifty Index Daily Returns fromApr2008 to Mar 2014
Estimated from XL-Stat, Values in bold are different from 0 with a significance level alpha=0.05

Months		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	Pearson Correl.	**1**											
Jan	**P-Value**	**0.00**											
	Pearson Correl.	-0.03	**1.00**										
Feb	**P-Value**	0.78	**0.00**										
	Pearson Correl.	0.05	0.04	**1.00**									
Mar	**P-Value**	0.58	0.64	**0.00**									
	Pearson Correl.	0.05	0.00	-0.01	**1.00**								
Apr	**P-Value**	0.63	1.00	0.88	**0.00**								
	Pearson Correl.	-0.05	0.16	-0.01	0.08	**1.00**							
May	**P-Value**	0.62	0.08	0.87	0.38	**0.00**							
	Pearson Correl.	-0.03	0.10	-0.06	-0.10	0.08	**1.00**						
June	**P-Value**	0.76	0.26	0.49	0.27	0.37	**0.00**						
	Pearson Correl.	0.10	**0.19**	-0.09	0.08	0.08	-0.15	**1.00**					
July	**P-Value**	0.28	**0.04**	0.33	0.38	0.39	0.11	**0.00**					
	Pearson Correl.	0.06	0.00	0.17	0.02	**0.19**	-0.07	0.02	**1.00**				
Aug	**P-Value**	0.52	0.96	0.06	0.80	**0.04**	0.46	0.83	**0.00**				
	Pearson Correl.	-0.03	0.03	0.10	**0.20**	-0.12	0.07	0.02	0.11	**1.00**			
Sept	**P-Value**	0.77	0.73	0.27	**0.03**	0.19	0.49	0.81	0.23	**0.00**			
	Pearson Correl.	-0.05	0.08	-0.08	**0.21**	-0.04	-0.03	0.05	0.11	0.07	**1.00**		
Oct	**P-Value**	0.60	0.42	0.42	**0.03**	0.71	0.75	0.56	0.26	0.46	**0.00**		
	Pearson Correl.	-0.11	0.01	0.00	-0.09	0.04	-0.04	-0.12	0.04	0.12	0.10	**1.00**	
Nov	**P-Value**	0.24	0.89	0.99	0.32	0.68	0.64	0.20	0.67	0.19	0.30	**0.00**	
	Pearson Correl.	0.00	**0.26**	0.00	**0.21**	0.09	0.13	0.02	0.01	-0.02	-0.03	-0.16	**1.00**
Dec	**P-Value**	1.00	**0.00**	0.98	**0.02**	0.35	0.16	0.84	0.93	0.84	0.75	0.08	**0.00**

Table 4: The Results of Correlation Test for S&P CNX Nifty Index Daily Returns fromApril2008 to March 2014
Estimated from XL-Stat, Values in bold are different from 0 with a significance level alpha=0.05

Months		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
	Pearson Correl.	**1**											
Jan	**P-Value**	**0.00**											
	Pearson Correl.	-0.16	**1.00**										
Feb	**P-Value**	0.09	**0.00**										
	Pearson Correl.	-0.14	0.00	**1.00**									
Mar	**P-Value**	0.13	1.00	**0.00**									
	Pearson Correl.	-0.07	-0.01	0.05	**1.00**								
Apr	**P-Value**	0.44	0.87	0.62	**0.00**								
	Pearson Correl.	0.14	0.12	0.08	0.06	**1.00**							
May	**P-Value**	0.12	0.22	0.39	0.54	**0.00**							
	Pearson Correl.	**0.25**	-0.11	-0.06	-0.13	-0.03	**1.00**						
June	**P-Value**	**0.01**	0.24	0.55	0.15	0.75	**0.00**						
	Pearson Correl.	**-0.24**	0.10	0.14	0.14	**-0.22**	**-0.18**	**1.00**					
July	**P-Value**	**0.01**	0.27	0.14	0.14	**0.02**	**0.05**	**0.00**					
	Pearson Correl.	-0.11	0.00	-0.11	**-0.20**	**-0.27**	-0.07	0.07	**1.00**				
Aug	**P-Value**	0.24	0.98	0.24	**0.03**	**0.00**	0.49	0.43	**0.00**				
	Pearson Correl.	**-0.19**	**0.19**	-0.09	-0.03	0.00	-0.04	**0.20**	-0.07	**1.00**			
Sept	**P-Value**	**0.04**	**0.04**	0.31	0.78	1.00	0.68	**0.03**	0.48	**0.00**			
	Pearson Correl.	0.07	-0.02	-0.11	-0.07	0.05	0.17	**-0.24**	-0.03	-0.07	**1.00**		
Oct	**P-Value**	0.48	0.84	0.26	0.47	0.56	0.07	**0.01**	0.73	0.48	**0.00**		
	Pearson Correl.	-0.11	0.09	-0.14	0.13	0.00	**-0.25**	0.17	-0.05	**0.36**	-0.09	**1.00**	
Nov	**P-Value**	0.25	0.35	0.14	0.16	0.99	**0.01**	0.07	0.62	< 0.0001	0.33	**0.00**	
	Pearson Correl.	**-0.28**	0.06	-0.02	0.12	-0.03	-0.02	-0.07	0.11	-0.16	0.17	-0.16	**1.00**
Dec	**P-Value**	**0.00**	0.53	0.82	0.19	0.78	0.85	0.48	0.26	0.09	0.08	0.09	**0.00**

Table 5: The Results of Correlation Test for S&P CNX Nifty Index Daily Returns fromApril2008 to March 2014

5.1. Unit Root Test

- Null Hypothesis, NH2: There is a unit root for the series. The series is non-stationary.

Results & Discussion of the ADF Test: The following table summarizes the results of the ADF test, which was carried out to check the level of integration of the data series.

Variables	Whole Period (0402-0314)		Sub-Period I (0402 – 0308)		Sub-Period II (0408 – 0314)	
	Observation	**Prob.**	**Observation**	**Prob.**	**Observation**	**Prob.**
All Months	2992	< 0.0001	1505	< 0.0001	1486	< 0.0001
January	234	< 0.0001	117	**0.086**	115	0.002
February	234	< 0.0001	117	< 0.0001	115	< 0.0001
March	234	< 0.0001	117	0.001	115	0.001
April	234	< 0.0001	117	< 0.0001	115	0.014
May	234	< 0.0001	117	0.001	115	< 0.0001
June	234	< 0.0001	117	0.013	115	0.005
July	234	< 0.0001	117	0.003	115	< 0.0001
August	234	< 0.0001	117	0.000	115	0.004
September	234	< 0.0001	117	0.001	115	0.000
October	234	< 0.0001	117	0.017	115	0.002
November	234	< 0.0001	117	0.002	115	0.018
December	234	< 0.0001	117	0.000	115	0.000

Table 6: Results of ADF Test for all periods
*Source: Computed from XLSTAT, * Significant at 5% level*

As the computed P-Value is lower than the significance level of 0.05 in all periods except in January of Sub-Period I which is also stationary at level 1. So the null hypothesis "**Ho: There is a unit root for the series"** is rejected and alternate hypothesis is accepted in all three time periods. So, the series is stationary at the level form. Thus, the OLS estimation technique can be applied to regress the above variables in order to capture the January effect.

5.2. Ordinary Least Squared (OLS) Regression for January Effect

- Null Hypothesis, NH3: There is no significant difference in daily mean returns among the trading days in a week. H_0: $b_1 = b_2 = b_3 = b_4 =$ ----------$= b_{11} = (0)$;

H_1: At least one of the coefficients is not equal to another coefficient

5.3. Results & Discussion of OLS Regression

Both whole period and sub- period I do not have significant coefficients across the months of the year and the F test is also insignificant. Thus, there is no any evidence of January effect during these two periods. However, during the sub period II, October has significant negative average return and it provides the evidences of negative October effect in the National Stock Exchange. Further, the F coefficient restriction test also significant at 5% level rejecting the null hypothesis. Consequently, it is apparent that the existence of the negative October effect during the sub-Period II.

	Variables	Coefficients	Std. Error	t-Stat	P-Value	F-Value	P-Value	R Square
April 2002- March 2014	**Intercept**	0.2041	0.0988	2.0658	0.0389	0.938	0.502	0.003
	January	-0.3172	0.1397	-2.2705	0.0232			
	February	-0.2313	0.1423	-1.6253	0.1042			
	March	-0.1318	0.1413	-0.9327	0.3510			
	April	-0.1096	0.1423	-0.7699	0.4414			
	May	-0.2468	0.1391	-1.7739	0.0762			
	June	-0.1542	0.1390	-1.1095	0.2673			
	July	-0.1206	0.1381	-0.8733	0.3826			
	August	-0.1373	0.1396	-0.9841	0.3251			
	September	0.0066	0.1402	0.0471	0.9625			
	October	-0.2102	0.1404	-1.4975	0.1344			
	November	-0.0831	0.1413	-0.5880	0.5566			
April 2002 - March 2008	**Intercept**	0.3037	0.1357	2.2387	0.0253	1.49	0.129	0.011
	January	-0.4546	0.1922	-2.3649	0.0182			
	February	-0.3108	0.1959	-1.5862	0.1129			
	March	-0.3817	0.1942	-1.9653	0.0496			
	April	-0.3090	0.1946	-1.5875	0.1126			
	May	-0.4382	0.1911	-2.2929	0.0220			
	June	-0.1137	0.1908	-0.5959	0.5513			
	July	-0.2121	0.1904	-1.1139	0.2655			
	August	-0.0823	0.1911	-0.4306	0.6668			
	September	-0.0518	0.1922	-0.2693	0.7877			
	October	-0.1326	0.1922	-0.6895	0.4906			
	November	-0.0020	0.1934	-0.0101	0.9919			
April 2008 - March 2014	**Intercept**	0.2153	0.2076	1.0371	0.2999	1.85	**0.04**	0.014
	January	-0.4524	0.2930	-1.5439	0.1228			
	February	-0.2483	0.2985	-0.8317	0.4057			
	March	0.2619	0.2966	0.8830	0.3774			
	April	0.2604	0.3005	0.8667	0.3863			
	May	-0.1977	0.2924	-0.6762	0.4990			
	June	-0.3841	0.2924	-1.3135	0.1892			
	July	-0.0028	0.2892	-0.0095	0.9924			
	August	-0.4244	0.2942	-1.4426	0.1493			
	September	0.1165	0.2954	0.3943	0.6934			
	October	-0.5830	0.2960	-1.9700	**0.0490**			
	November	-0.3440	0.2979	-1.1550	0.2483			

Table 7: Statistics of daily regression (Summary Output)
*Source: Computed from Excel * Significant at 5% level*

6. Summary

The study mainly tests the existence of one of the most famous market anomaly i.e. January effect in the Indian stock market by using the daily logarithmic percentage return categorized into respective months from January to December of S&P CNX Nifty. To check the normality of the data set, we have used Jarque-Bera test whose value of coefficients was significant at five percent level of significance for all trading months except June, august & September of sub-period II. This implies that the returns were asymmetric and did not conform to normal distribution during the all study period.

Bar graphs have been used for the pictorial representation of the mean return of respective months. Tocheck the relationship between the returns of different months of the year cross correlation test is used, in which relationship was found out negligible in all study periods Highest positive correlation is found out between September & Nov i.e. **0.36** in sub-period II.

To check the stationarity of the time series data, unit root test has been used. The results of ADF test confirm the series is stationary at the level form except January returns in Sub-Period I. Thus, it supports the use of OLS regression technique to test any presence of January effect in S&P CNX Nifty.

7. Conclusions

The result is robust and there is minimal effect of crisis on returns as no any January effect is found out in any of the periods. None of the positive or negative returns is found out significant in whole period & Sub-Period I but Negative Oct effect is found out in Sub-Period II.

January Effect				
Years	**Highest Return (Month)**	**Statistically Significant**	**Lowest Return (Month)**	**Statistically Significant**
April2002-March 2014	September	No	January	No
April 2002 –March 2008	November	No	January	No
April 2008 –March 2014	March	No	October	**Yes**

Table 8: Summary of return pattern of three sub-divided periods

8. Limitations of the Study

The following are the limitations of the present study.

a. This study is restricted to Indian Capital Market alone and to only one Index of NSE.
b. This study is based mainly on secondary data.
c. The only publicly available data on closing prices has been used.
d. This study used certain limited statistical tools which have certain inherent limitations.
e. The study did not analyze the other Calendar anomalies like Day-of-the-Week effect, Quarterly Effect, Week of the Month Effect, etc., and also other fundamental & technical anomalies.
f. Resources are limited for the research.
g. Limited to January effect only.

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