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AN EMPIRICAL ANALYSIS OF JANUARY ANOMALY IN THE INDIAN STOCK MARKET

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ABSTRACT

Any anomaly, including January Anomaly, would enable the investors and speculators to gain abnormal returns. The presence of January Anomaly defeats the basic premises of the efficient market hypothesis. Besides, it has greater implications for the design of investment strategy in the long run. This paper seeks to find out whether the 'January Anomaly', found in many countries, is also found in the fast developing Indian Markets. The study used the logarithmic data for S&P CNX Nifty and S&P CNX 500 sample indices and applied the Dummy Variable Regression Model from 1st April 2002 to 31st March 2011. It is found that the highest mean return was earned in December and the lowest/ negative mean return earned in January Month for S&P CNX Nifty index. The S&P CNX 500 Index recorded the Highest Mean Return in the Month of March and the Highest Negative Mean Returns in the Month of January. It is found that there was significant difference in the mean returns among the different months of the year. The analytical results of seasonality indicate the absence of January Anomaly during the study period.

KEYWORDS: January Anomaly, Seasonality, Efficient Market Hypothesis, Dummy Variable Regression Model, K-W Test

INTRODUCTION

The analysis of share price behavior has been a topic of importance among researchers and portfolio managers for several decades. The 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. The different patterns identified in stock returns include the January Effect, Day of The Week Effect, Different Monthly Effect like Turn of the Month Effect, Semi Month Effect, the End of the Month Effect, etc.

January Effect is the most studied pattern of month of the year effect. It is established that in January, the stock return is higher than that of other months of the year. It may be caused normally by a significant low return in December.

There are many studies to explain why the January Effect exists, and one of the most discussed reasons is the Tax-Loss Selling Hypothesis. According to this hypothesis, the investors normally sell the losing stocks till the end of the tax year.

In fact, the investors try to increase the capital losses, and thereby they can reduce the burden of the tax liability. There were supportive evidence to the tax-loss selling, **Reinganum M (1983)** and **Roll R (1983)**.The consequence is that

the declining stocks have to face a downward pressure, but at the beginning of the next year, the downward pressure will disappear due to the absence of selling pressure. Therefore, the stock prices can gain their real market value.

The January Effect suggests the abnormal returns in January and such effects are due to the new information provided by the firms at the end of the fiscal year (**Rozeff MS, Kinney WR. 1976),** because the financial earning announcement is made normally in January. 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 hence the same is the scope of this paper.

REVIEW OF LITERATURE

Several studies have been conducted to analyze the Calendar Anomaly of Indian as well as Global Capital Market. The reviews of previous studies made in India and abroad are given below.

Pandey IM (2002) investigated the existence of Seasonality in India's Stock Market for the post reform period. After examining the stationarity of the return series, the study found that there was Monthly Effect in stock returns in India. The results of the study indicate that the Stock Market in India was inefficient, and hence investors can time their share investments to improve returns. **Seyed Mehdian, Mark J. Perry (2002)** studied the January Effect in US Equity Markets. It was found that January Returns were positive and significant in all three Stock Market Indices. After 1987, January Returns were positive but not statistically different from zero. **Hareesh Kumar.V and Malabika Deo (2007)** analyzed the efficiency of Indian Stock Market by using S&P CNX 500 Index. The study found the presence of Day of the Week Effect in the Indian Stock Market, which affected both the stock returns and volatility, thereby proving the Indian Stock Market to be inefficient. **Gagari Chakrabarti, Chitrakalpa Sen (2008)** investigated the Month of the Year Effect in the Indian Stock Market. This study studied the presence of Calendar Anomaly, with asymmetric market reactions, using TGARCH Model. **Rengasamy Elango, Dayanand Panday (2008)** examined the January Anomaly and market return- pattern for the five prominent indices of the NSE. The analysis revealed that March and April recorded significant negative returns and therefore, these two months are the best period to buy the scrips and November and December showed significant positive high returns. **Ushad Subadar Agathee (2008)** studied the possible Month of the Year Effect in the Stock Exchange of Mauritius (SEM). The result showed that returns were the lowest in the Month of March and the highest in the Month of June. But equality of mean returns test showed that the returns were statistically the same across all months. **Khokan Bepari and Abu Taher Mollik (2009)** investigated the existence of seasonality in return series of DSE, Bangladesh.

The study confirmed the existence of seasonality in stock returns in DSE but could not support the tax loss selling hypothesis. The study found that there was an April Effect in DSE and invalidated the paradigm of the efficient market hypothesis in DSE. **Anokhi Parikh (2009)** examined the month-of-the-year in the Indian Stock Market, using GARCH and Exponential GARCH model employed to test for calendar anomalies in the National Stock Exchange Index. The results confirmed the presence of a significant 'December Effect' in the Indian Stock Market even after taking time varying volatility into account. **Nageswari P** and **Selvam .M (2011)** investigated the Monthly Effects using S&P CNX 500 Index returns. It showed that there was maximum average return earned for the month of April and negative return for the month of January & February. Also found that insignificant monthly effect existed in Indian Stock Market. **Nageswari P** and **Selvam .M (2011)** revealed that highest mean return for the month of November and negative mean for January, February & March. The study concluded that, Day of the Week Effect and Monthly Effect did not appear to exist in the Indian Stock Market

The above literature provides an overview of valuation of Monthly Effects in various Global Stock Markets. It is to be noted that only a few have focused on the January Anomaly in the Indian Markets. Against this backdrop, 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.

STATEMENT OF THE PROBLEM

The Firms and Governments generally release good news between Monday and Friday and bad news on the week-ends. As a result, the bad news is reflected in lower stock prices on the next trading day (Mondays) and good news is reflected in higher stock prices on Friday. This would reduce the share price further. Similarly, in the Month of January, firms normally release new information pertaining to the previous accounting year. When new positive information reaches the market, the prices become bullish due to buying pressure.

The active trading strategies, based on the knowledge of market anomalies, would provide benefits to the investors; but the countervailing arbitrage will also exploit the excess return over time. In this environment, it is necessary to periodically find out whether these types of Anomalies exist in the Stock Market. Against this background, the present study covering Analysis of Monthly Effects in Indian Stock Market is significant.

OBJECTIVES OF THE STUDY

The present study intends to identify whether the monthly effect exists in the Indian Stock Market.

HYPOTHESIS OF THE STUDY

The present study tested the following null hypothesis

NH1: There are no significant differences among the month wise daily returns.

METHODOLOGY OF THE STUDY

Sample Selection

The indices are the best indicator of the performance of the whole economy. The S&P CNX 500 is India's first broad based benchmark of the Indian capital market. For the purpose of this study, S&P CNX Nifty and S&P CNX 500 Index were considered as sample Indices.

Sources of Data

The required information of the present study were collected from www.nseindia.com and prowess, which is a corporate database maintained by CMIE.

Period of the Study

The present study covers a period of nine years from 1st April 2002 to 31st March 2011.

TOOLS USED FOR ANALYSIS

The following tools were used for the analysis of the returns and volatility for the sample indices taken for this study.

Returns

The formula below was used to compute the daily returns for each of the index series

$$R_t = \ln\left[\frac{I_t}{I_{t-1}}\right] * 100$$

Where,

R_t = Daily return on the Index (I),

ln = Natural log of underlying market series (I),

I_t = Closing value of a given index (I) on a specific trading day (t), and

I_{t-1} = Closing value of the given index (I) on preceding trading day (t-1).

Descriptive Statistics

Under Descriptive Statistics, the Average Daily Returns (mean), Standard Deviation, Skewness and Kurtosis were used.

Kruskall-Wallis Test

The Kruskall-Wallis Test was employed for testing the equality of mean returns among different months of the year. The formula for calculating the Test Statistic '*H*' is as under:

$$H = \frac{12}{N(N+1)} X \sum_{J=1}^{5} \frac{R2j}{nj} - 3(n+1)$$

Where,

Rj = Sum of the Ranks in the *j*th Column,

nj = Number of Cases in the *j*th Column, and

N= Sum of Observations in all the Columns

Dummy Variable Regression Model

In order to investigate the January Effect, the following dummy variable regression equation was used.

$Rt = \beta 1\ D1(Jan) + \beta 2\ D2(Feb) + \ldots.. + \beta 12\ D12(Dec) + \varepsilon t$ (5)

Where,

Rt = Index return percent in the month t;

D1(Jan) = dummy variable equal to 1 if t is a January and 0 otherwise,

D2(Feb) = dummy variable equal to 1 if t is a February and 0 otherwise,

.....

D12(Dec) = dummy variable equal to 1 if t is a December and 0 otherwise,

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

The intercept, $\beta 1$ …….. $\beta 12$, represent the average deviation of each month from the January Return. Thus, if the monthly returns are equal, one expects the dummy variable coefficients to be statistically close to zero. The coefficients of the regression are the mean returns obtained from January to December by applying Ordinary Least Square (OLS). Ultimately, if NSE indices register January effect, its estimated co-efficient 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 (**Rengasamy Elango, Dayanand Panday - 2008**).

ANALYSIS OF JANUARY ANOMALY IN INDIA

Analysis of Descriptive Statistics

Table-1 exhibits the results of Descriptive Statistics for S&P CNX Nifty and S&P CNX 500 Index returns for the period from 1st April 2002 to 31st March 2011. The above Table observes that the Highest Mean Return (0.2900) was earned in December and the Lowest / Negative Mean Return (-0.1711) earned in January for S&P CNX Nifty index. But in the case of S&P CNX 500 Index, the Highest Mean Return was recorded in the Month of March (0.9910) and the Highest Negative Mean Returns was recorded in the Month of January (-0.1863). It is to be noted from the above Table that the month of January and February recorded negative returns. While the next month (March) recorded high returns (0.9910).

It may be due to some unanticipated events or corporate announcements that would have been reflected in the stock prices in March. This implies that during the study period, the market showed positive trend in the last month of the year while negative trend was recorded at the first month of the calendar year. It is found that November and December offer reasonably high returns and hence if investors want to sell their holdings, these two months could be considered as the best period. Some festivals are celebrated in India in the Month of October.

The people of India normally spend more money for festival and so there may be no buying and selling of shares. This could be the reason for the Negative Returns earned during the Month of October. The Deepavazhi is celebrated in the Month of October and this may be the reason for negative returns in the month of October. In the Month of June, the educational institutions start functioning. The investors generally spend more money for their children's education and they may want to sell their holdings.

From the above Table, it is to be noted that the Standard Deviation for the month wise mean returns of S&P CNX Nifty ranged from 1.36% to 2.47% during the study period. The Highest Value (2.4760) of Standard Deviation was recorded in the Month of May, with the least positive mean return and the Lowest Value (1.3661) of Standard Deviation, being earned during the Month of September. This indicates the fact that there was non- linearity between risk & return of S&P CNX Nifty Index in the National Stock Exchange.

In short, the market (NSE) was more volatile in May and least volatile in September. For the S&P CNX 500 Index, that the Month of March registered High Return (0.99), with High Risk (12.95). This indicates there was linear relationship between the risk and returns of S&P CNX 500 Index during the study period. This study also found that there was the least Standard Deviation of the return recorded in the Month of December. It implies that the stock market was more volatile in the Month of March and least volatile in the Month of December during the study period.

According to the above Table, the return distribution of S&P CNX Nifty was positively skewed in the Month of May and negatively skewed in all Other Months of the Year. During the study period, the result of kurtosis measure of the Month wise Return Distribution was Leptokurtic for all months of the year and highest (18.48) in May. The reason for non-normality of S&P CNX Nifty Index could be the high kurtosis.

In the case of S&P CNX 500, the month wise return distribution was positively skewed in March and May and negatively skewed for all other months. The Highest Skewness was recorded in the Month of March.

Regarding kurtosis measure, the Month wise Return Distribution of S&P CNX 500 was Leptokurtic in all months of the year and the Highest Value (159.67) was recorded in the Month of March during the study period.

Analysis of Kruskall-Wallis Test

The Results of Kruskall-Wallis Test for S&P CNX Nifty and S&P CNX 500 Index Returns for the period from 1st April 2002 to 31st March 2011 are presented in **Table-2**. As stated earlier**,** the Kruskall-Wallis Test is commonly used to test the equality of mean returns of the different months of the year. The above Table shows that the Value of Kruskall-Wallis Test Statistic was lower than the Table Value (19.67) at 5% level of significance in 11 degrees of freedom for S&P CNX Nifty Index Returns. It clearly indicates that there was no significant difference between the returns of different months of the year. But in the case of S&P CNX 500 Index Returns, the Test Statistic was higher (22.144) than the Table Value (19.67) at 5% level of significance in 11 degrees of freedom. It is found that there was significant difference in the mean returns among the different months of the year.

Analysis of Dummy Variable Regression Model

Table 3 shows the Results of the Linear Regression Analysis for S&P CNX Nifty and S&P CNX 500 Index from April 2002 to March 2011. It is to be noted that the Benchmark Month in the Model was January, represented by the Intercept. It is understood from the above Table that there was positive coefficient value earned for S&P CNX Nifty in all months of the year except January. The Values of Coefficients in December, followed by November, were High and statistically significant at 5% risk level. This indicates the presence of November and December Effect in S&P CNX Nifty Index (month wise returns).The above Table also reveals that the adjusted R-squared value of 0.0058 was low. However, from the insignificant F-value, the Null Hypothesis, namely, "There is no significant difference among the month wise daily returns", is accepted. This study did not confirm any Anomalies in S&P CNX Nifty Index during the study period.

The S&P CNX 500 Index Returns recorded Positive Coefficient Value for all months of the year, except January. It is to be noted that the values of coefficients in April, July, August and November were statistically significant at 5% level. In addition, the coefficient in December was quite high and significant at 1% level. The Null Hypothesis, namely, "There is no significant difference among the month wise daily returns", cannot be accepted because the F-value was not statistically significant at conventional level of significance. In other words, there was no Monthly Anomaly in the case of S&P CNX 500 Index Returns during the study period. The adjusted R-squared value of 0.0086 clearly indicates the fact that only 8.6 percent influenced these variables. Besides, F-statistic indicates that the overall fit of the model was poor. Further, Durban-Watson Statistic of 1.78 indicates autocorrelation in the residuals.

FINDINGS OF THE STUDY

The following are the important findings of the present study

- The analysis reveals that the Highest Mean Return (0.2900) was earned in December and the Lowest/ Negative Mean Return (-0.1711) was earned in January for S&P CNX Nifty Index. But in the case of S&P CNX 500 Index, there was Highest Mean Return in the Month of March (0.9910) and the Highest Negative Mean Returns in the Month of January (-0.1863).

- The analysis of study found that High Mean Returns were recorded in the month of December, followed by November. Hence logically speaking, if the investors want to sell their holdings, these two months (November and December) could be considered as the best period. The shares may be bought in the month of January which is the best period to buy the shares.

- The Standard Deviation of the month wise mean returns of S&P CNX Nifty ranges from 1.36% to 2.47% during the study period. The Highest Value (2.4760) of Standard Deviation was recorded in the Month of May, with the

least mean return and the Lowest Value (1.3661) of Standard Deviation, being earned during the Month of September.

- This indicates the fact that there was non- linearity between risk & return and month wise S&P CNX Nifty Index Returns during the study period.
- During the study period, the S&P CNX 500 Index Return recorded the Highest Mean Return (0.9910), Standard Deviation (12.9517), Kurtosis (159.67) and High & Positive Skewness (12.4896) in the month of March compared to other months and other sample indices. It indicates that in the month of March, the market was highly fluctuating and the return was not normally distributed.
- The Month of October recorded High Risk with Negative Returns for selected sample indices and hence Regulators may study the market situation and control the same. Investors are advised to carefully take the investment decisions.
- The month wise return distribution was Positively Skewed in the month of May and Negatively Skewed for the remaining months for S&P CNX Nifty Index. The Peak of the Month wise Return distribution was Leptokurtic for all the months of the year and the Highest Value was recorded in the month of May.
- The analysis of Kruskall-Wallis Test Statistic was significant only for S&P CNX 500 Index at 5% level of significance. It means that the differences in the mean returns across the months were statistically significant during the study period.
- The Seasonal Analysis reveals that the Coefficient Value in November and December were significant for S&P CNX Nifty and S&P CNX 500 Index Returns were significant for April, July, August, November and December. However, the insignificant F-value indicates that November and December Anomalies were not confirmed during the study period.

CONCLUSIONS

This study examined the January Anomaly by using 'Month Wise' daily return for S&P CNX Nifty and S&P CNX 500 Index. The study used the logarithmic data for selected sample indices and employed the Dummy Variable Regression Model. The result of the study found that the Highest Mean Return was earned in December and the Lowest/ Negative Mean Return was earned in January for S&P CNX Nifty Index. The S&P CNX 500 Index Return recorded the Highest Mean Return in the Month of March and the Highest Negative Mean Returns in the Month of January.

The seasonality analysis indicates the absence of January Anomaly during the study period. The study further reveals that January and February recorded significant negative returns and they are the best months to buy the scrips (buy low). The months of November and December recorded significant positive high returns and these two months are the best period to sell the securities (sell high). The Tax Loss Selling Hypothesis could be the possible explanations for the above phenomenon. The findings violate the basic premises of the efficient market hypothesis in its weak-form and this phenomenon could be considered as a superior opportunity for the investors to earn reasonable returns from the market.

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Table 1: The Results of Descriptive Statistics for S&P CNX Nifty and S&P CNX 500 Index Daily Returns (Month wise) from April 2002 to March 2011

	S&P CNX Nifty					S&P CNX 500 Index				
Month	**Mean**	**Std. Dev.**	**Skewness**	**Kurtosis**	**Obs.**	**Mean**	**Std. Dev.**	**Skewness**	**Kurtosis**	**Obs.**
JAN	-0.1711	1.9367	-0.4361	6.8303	165	-0.1863	2.0540	-0.7882	8.4038	165
FEB	-0.0253	1.4903	-0.2947	4.6795	156	-0.0452	1.4344	-0.3804	5.2846	156
MARCH	0.0267	1.7148	-0.4186	4.5801	166	0.9910	12.9517	12.4896	159.6708	167
APRIL	0.1215	1.5264	-0.3886	4.0609	156	0.2121	1.4162	-0.5065	4.2159	156
MAY	0.0088	2.4760	0.6273	18.4803	169	0.0681	2.4440	0.0852	16.3264	169
JUNE	0.0140	1.7329	-0.0358	3.9663	173	-0.0299	1.7708	-0.2680	4.3416	173
JULY	0.1510	1.7097	-0.2719	4.3176	177	0.1705	1.6602	-0.2729	4.3955	176
AUG	0.1749	1.3764	-0.5536	4.1948	170	0.2173	1.3447	-0.6209	4.3356	170
SEP	0.1785	1.3661	-0.1264	4.5142	167	0.1372	1.3449	-0.5188	4.8781	167
OCT	-0.1006	2.2605	-1.0489	10.0024	166	-0.1300	2.1235	-0.9937	8.8320	166
NOV	0.2427	1.6681	-0.3291	6.3070	161	0.2512	1.5345	-0.4160	5.6439	161
DEC	0.2900	1.3747	-0.0248	4.8614	169	0.3572	1.3188	-0.4112	5.0046	169

Source: Computed from PROWESS. Using Excel

Table 2: The Results of Kruskall-Wallis Test for S&P CNX Nifty and S&P CNX 500 Index Daily Returns (Month wise) from April 2002 to March 2011

Indices	**K-W Test**	**Df**	**P-value**
S&P CNX Nifty	15.3026	11	0.1690
S&P CNX 500	22.144	11	0.0233*
Degrees of freedom. N-1 11 N=12		Table value: 1% - 24.725 5% - 19.675	

Source: Computed from PROWESS. *Significant at 5% level.

Table 3: The Results of Dummy Variable Regression Model for S&P CNX Nifty and S&P CNX 500 Index Daily Returns – (Month wise) from April 2002 to March 2011

	S&P CNX Nifty Index				S&P CNX 500 Index				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**	
FEB	0.1458	0.1959	0.7445	0.4567	0.1411	0.1914	0.7373	0.461	
MARCH	0.1979	0.1928	1.0261	0.3050	0.1833	0.1884	0.9729	0.3307	
APRIL	0.2927	0.1959	1.4940	0.1353	**0.3983**	0.1914	2.0816	0.0375**	
MAY	0.1800	0.1920	0.9373	0.3487	0.2544	0.1875	1.3565	0.1751	
JUNE	0.1851	0.1909	0.9698	0.3323	0.1564	0.1865	0.8385	0.4018	
JULY	0.3222	0.1898	1.6971	0.0898	**0.3567**	0.1857	1.9212	0.0548**	
AUG	0.3461	0.1917	1.8052	0.0712	**0.4036**	0.1873	2.1550	0.0313**	
SEP	0.3496	0.1926	1.8155	0.0696	0.3234	0.1881	1.7196	0.0857	
OCT	0.0705	0.1928	0.3657	0.7146	0.0563	0.1884	0.2987	0.7652	
NOV	**0.4139**	0.1943	2.1297	0.0333**	**0.4374**	0.1898	2.3043	0.0213**	
DEC	**0.4611**	0.1920	2.4018	0.0164**	**0.5434**	0.1875	2.8978	0.0038*	
C	-0.1711	0.1366	-1.2531	0.2103	-0.1863	0.1334	-1.3962	0.1628	
Adjusted R-squared	0.0058	F-statistic		1.0528	Adjusted R-squared	0.0086		1.5565	1.5565
D.W.	1.8752	Prob(F-statistic)		0.3966	D.W.	1.7875		0.1053	0.1053

Source: Computed from PROWESS *Significant at 1% level. **Significant at 5% level.