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Analysis of Monday Effect in Indian Stock Market

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ABSTRACT

The Anomaly, namely, 'Weekend Effect' was found in many developed and developing markets around the world, including rapidly emerging Indian Equity Market. The Weekend Effect or Day of the Week Effect has been a hot research topic among academicians for decades. The most popular Anomaly is the Monday Effect, meaning that the Monday's Average Return is significantly lower than the Other Days' Average Returns. The presence of Monday Effect defeats the basic premises of the Efficient Market Hypothesis. Besides, it has greater implications on the design of investment strategy in the long run. This study proposes to discover the 'Monday Effect', in Indian Stock Markets. It is found that there was the highest mean return earned in Friday and the lowest/negative mean return earned in Monday for the sample indices. Besides, there was no significant difference in the mean returns among the different days of the week. The analysis of Seasonality results showed that there was no significant day of the week effect in the Indian stock market during the study period.

Key words: Day of the week effect, Monday effect, efficient market hypothesis, seasonality, dummy variable regression model

INTRODUCTION

Market Efficiency influences the Investment Strategy for investors because in an efficient market, there would be no undervalued or overvalued stocks. The efficient market theory states that an informationally efficient market is one where the market price is an unbiased estimate of the true value of the investment. It further states that the current market price of a security fully reflects all available information and the current price is the fair price as the security has traded in that price (Fama *et al.*, 1969). In the words of Fama, "the informational efficiency of financial markets requires that the market prices and rates of return at any given time reflect all the information available to the participants" (Fama, 1970).

The academics and practitioners have documented many research works on the Seasonality and associated behavior of securities markets all over the world. Among others, the most widely mentioned Seasonal Effects and market anomalies are January effect, Monday effect or week-end effect, holiday effect and small firm effect, to mention a few. Among these, one of the widely discussed anomalies is the Monday stock return. The most common case is the Monday effect, meaning that the Monday's average return is significantly lower than the other days' average returns. Fridays normally present the highest return over majority of the stock markets of the world. However, some empirical studies in different stock markets have established the Tuesday

Effect instead of the Monday Effect. During the past decades, many studies about the Day of the Week Effect have been carried out.

It is significant to note that there is a reason for the day of the week effect. Monday recorded high return in some markets. In another, Monday recorded lower return. The reason is that Monday is the day with the lowest trading volume and in which the propensity of individuals to transact is higher relative to other days of the week and that of the institutions is the lowest. The propensity of individuals to sell on Monday is higher than their propensity to buy (Lakonishok and Maberly, 1990).

The other reason is that the Settlement Cost has been used to explain day of the week variations. There are five trading days in a stock market. If the settlement day is the second trading day, the Thursday return will be higher than rest of the week days. If the investors buy on the Wednesday's close price and sell on the Thursday's close price, then investors will earn high return on Thursday. Another main reason is the individual investors' behavior. The individual investors would like to sell more on Monday due to the reason that the bad news is normally released in the prior week and the individual investor tends to use Monday as the opportunity to satisfy the liquidity needs. It is hard to say that the day of the week effect can generate abnormal returns. It is always possible to find the abnormal returns for short periods but it seems a much harder task to generate abnormal returns over a longer period, as Anomalies vary over time and tend to disappear or even reverse after they have been discovered.

Ravi and Goswami (2000) studied the week-end effects by using equally weighted portfolio constructed from 70 stocks listed on the BSE. The study evidenced the (heteroskedasticity adjusted) excess positive returns on Friday and excess negative returns on Tuesday. Amanulla and Thiripalraiu (2001) proposed to find out whether the carry-forward transactions in different periods have any impact on week-end effect in the Indian Stock Market. The results from the sub-sample period strongly supported the existence of week-end effect during the period of ban on carry forward (badla) transactions. This study also evidenced a reversal in Week-End Effects, i.e., positive Monday return and negative Friday return in modified and revised modified carry forward transactions. Brooks and Persaud (2001) examined the evidence for the Day of the Week Effect in five Southeast Asian Stock Markets-Taiwan, South Korea, the Philippines, Malaysia and Thailand. The Authors found that neither South Korea nor Philippines recorded significant Calendar Effects. But both Thailand and Malaysia registered significant positive average returns on Monday and significant negative average returns on Tuesday. In addition, the study also documented a significant negative Wednesday Effect in Taiwan. Nath and Dalvi (2005) used both high frequency and end of day data for the benchmark index (S and P CNX Nifty). The study, using Regression with bi-weights and dummy variables, found that before the introduction of Rolling Settlement in January 2002, Monday and Friday were significant days. However, after the introduction of the Rolling Settlement, Friday has become significant. The market inefficiency still exists and the market was yet to price the risk appropriately. Basher and Sadorsky (2006) used both unconditional and conditional risk analysis to investigate the day-of-the-week effect in 21 emerging stock Markets. The results of this study showed that while the Day-of-the-Week Effect was not present in the majority of Emerging Stock Markets studied, some Emerging Stock Markets did exhibit strong day-of-the-week effect even after accounting for conditional market risk. Kumar and deo (2007) analyzed the efficiency of Indian stock market by using S and 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. Elango and

Al-Macki (2008) investigated whether the anomalous Week End Effect was found in the rapidly emerging Indian Equity Market. Their analysis produced mixed results, indicating that the Monday Returns were negative and low in the case of two out of three indices. The study also examined the Week End Effects and showed that Monday Returns were negative in one of the bench mark indices. Nageswari and Babu (2011) examined the Week End Effect in the Indian Stock Market. The study found that the mean returns were positive for all days of the week, highest on Friday and lowest on Monday. It was inferred that the Day of the Week Pattern did not exist in the Indian Stock Market during the study period. Nageswari and Selvam (2011) explored the Day of the Week Effect during the Post Rolling Settlement Period. The study found that the Highest Mean Return on Friday and the Lowest Mean Return on Tuesday were observed during the study period. Further, there was strong significant positive relationship between Monday-Friday and no significant relationship among other days of the week. The results indicated that the Day of the Week Effect did not exist in the Indian Stock Market during the study period.

The above literature provides an overview of Day of the week Effects in various Global Stock Markets. It is to be noted that only few have focused on the Monday Effect in the Indian Stock 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.

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 on Monday Effects in the Indian Stock Market is significant.

The present study intends to identify and analyze the Monday Effect in the Indian Stock Market.

The present study tested the following null hypothesis: NH1: There are no significant differences among the returns of different trading days of the week.

MATERIALS AND METHODS

Sample selection: The indices are the best indicator of the performance of the whole economy. The S and P CNX Nifty is well diversified, with 50 stocks accounting for 22 Sectors of the Economy. It represents about 56% of the Free Float Market Capitalization as on September 30th, 2010. The S and P CNX 500 is India's first broad based benchmark of the Indian Capital Market. It represents about 90% of the Free Float Market Capitalization and about 87% of the total turnover on the NSE. For the purpose of this study, S and P CNX Nifty and S and P CNX 500 Index were considered as Sample Indices.

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

Period of the study: The present study covers a period of eight years from 1st April 2002 to 31st March 2010.

Tools used for analysis: The following tools were used for the analysis of the returns and volatility of 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)
- 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 Kruskal-Wallis Test is 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:

$$H = \frac{12}{N(N+1)} \times \sum_{j=1}^5 \frac{R2_j}{n_j} - 3(n+1)$$

Where:

- R_j = Sum of the Ranks in the jth Column
- n_j = Number of Cases in the jth Column
- N = Sum of Observations in all the Columns

Dummy variable regression model: In order to investigate the Monday Effect, the following dummy variable regression equation is used:

$$R_t = \beta_1 D_{1(\text{Mon})} + \beta_2 D_{2(\text{Tue})} + \dots + \beta_5 D_{5(\text{Fri})} + \epsilon_t$$

Where:

- R_t = The return of the Index on day t
- $D_{1(\text{Mon})}$ = Dummy variable equal to 1 if t is a Monday and 0 otherwise
- $D_{2(\text{Tue})}$ = Dummy variable equal to 1 if t is a Tuesday and 0 otherwise
- $D_{3(\text{Wed})}$ = Dummy variable equal to 1 if t is a Wednesday and 0 otherwise
- $D_{4(\text{Thu})}$ = Dummy variable equal to 1 if t is a Thursday and 0 otherwise

$D_{5(Fri)}$ = Dummy variable equal to 1 if t is a Friday and 0 otherwise
 $\hat{\epsilon}_{i,t}$ = Error term

The intercept, β_1, \dots, β_5 , represent the average deviation of each day from the Monday return. Thus, if the daily 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 Monday to Friday, applying the Ordinary Least Square (OLS).

RESULTS AND DISCUSSION

Analysis of descriptive statistics: Table 1 exhibits the results of Descriptive Statistics for S and P CNX Nifty and S and P CNX 500 Index returns for the period from 1st April 2002 to 31st March 2010. The above Table clearly observes that the S and P CNX Nifty Index returns recorded the Highest Mean Return (0.1521) on Friday and the Lowest Mean Return (0.0175) earned on Monday. This Anomaly be due to some unanticipated events or corporate announcements that would have been reflected in the stock prices. The Standard Deviation for the mean returns of S and P CNX Nifty Index ranged from 1.56 to 2.12% during the study period. The Highest Value (2.1226) of Standard Deviation was recorded on Monday, with the least mean return and the Lowest Value (1.5687) of Standard Deviation, earned on Tuesday. This indicates the fact that there was non-linearity between risk and return of S and P CNX Nifty Index in the National Stock Exchange. In short, the market (NSE) was more volatile on Monday and least volatile on Tuesday. The return distribution of S and P CNX Nifty was positively skewed on Monday and Tuesday and negatively skewed on other days of the week. During the study period, the result of kurtosis measure of Return Distribution was Leptokurtic for all days of the week and highest (15.59) on Monday. The reason for non-normality of S and P CNX Nifty Index could be the high kurtosis.

The analysis of S and P CNX 500 Index found that there were positive mean returns for all days of the week. The highest mean return (0.1701) was recorded on Friday and the lowest mean return on Monday during the study period. This study also found that there was the least Standard Deviation of the return recorded on Thursday and highest on Monday. It implies that the stock market (NSE) was more volatile on Monday and least volatile in Thursday during the study period. According to the analysis of S and P CNX 500 Index, the return distribution was positively skewed on Tuesday and negatively skewed for remaining days of the week. Regarding kurtosis measure, the Return Distribution of S and P CNX 500 was Leptokurtic for all days of the week and the highest value (14.21) was recorded on Monday during the study period.

Table 1: The results of descriptive statistics for S and P CNX Nifty and S and P CNX 500 index daily returns from April 2002 to March 2010

Weekdays	S and P CNX nifty index					S and P CNX 500 index				
	Mean	S.D	Skew.	Kurt.	Obs.	Mean	S.D	Skew.	Kurt.	Obs.
Monday	0.0175	2.1226	0.114	15.5966	397	0.0306	2.0981	-0.378	14.2079	397
Tuesday	0.0695	1.5687	0.1231	6.9146	398	0.0509	1.5641	0.0042	6.8333	398
Wednesday	0.0926	1.5951	-0.1379	5.1483	400	0.1095	1.5766	-0.2718	5.753	400
Thursday	0.04	1.5887	-0.379	5.0695	395	0.0484	1.5213	-0.5571	5.9916	395
Friday	0.1521	1.8616	-1.0987	10.946	393	0.1701	1.7803	-1.2054	10.5743	392

Source: Computed from PROWESS

Analysis of Kruskal-Wallis test: The results of Kruskal-Wallis Test for S and P CNX Nifty and S and P CNX 500 Index Returns from 1st April 2002 to 31st March 2010 are presented in Table 2. As stated earlier, the Kruskal-Wallis Test is commonly used to test the equality of mean returns of the different days of the week. The above Table clearly shows that the Value of Kruskal-Wallis Test Statistic (S and P CNX Nifty-2.29 and S and P CNX 500 Index-5.28) was lower than the Table value (9.488) at 5% level of significance in 4 degrees of freedom for the sample Index returns. It clearly indicates that there was no significant difference between the returns of different days of the week.

Analysis of dummy variable regression model: Table 3 shows the results of the linear regression analysis for S and P CNX Nifty and S and P CNX 500 Index from April 2002 to March 2010. It is to be noted that the Benchmark Month in the Model was Monday, represented by the Intercept. The Values of Coefficients in Thursday was high and none of the variables was statistically significant at conventional level of risk in S and P CNX Nifty Index 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 different days of the week” is not rejected. It indicates that the study did not confirm any Anomalies in S and P CNX Nifty Index during the study period.

The S and P CNX 500 Index returns recorded Positive Coefficient Value for all days of the week. It is to be noted that the value of coefficients (0.3983) on Thursday was high and statistically significant at 5% level. Hence the Null Hypothesis viz., “There is no significant difference among the different days of the week” cannot be rejected because the F-value was not statistically significant at conventional level of significance. In other words, there was no day effect in case of S and 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% 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.

Table 2: The results of Kruskal-Wallis test for S and P CNX Nifty and S and P CNX 500 index daily returns from April 2002 to March 2010

Indices	K-W test	Df	p-value
S and P CNX Nifty	2.2938	4	0.6819
S and P CNX 500	5.2893	4	0.2588

Source: Computed from PROWESS using SPSS, Degrees of freedom. N-1 4, N = 5, Table value: 1%-13.277, 5%: 9.488

Table 3: The results of dummy variable regression model for S and P CNX nifty and S and P CNX 500 index daily returns from April 2002 to March 2010

Variable	S and P CNX Nifty Index				S and P CNX 500 Index			
	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient	Std. Error	t-Statistic	Prob.
Tuesday	0.1458	0.1959	0.7445	0.4567	0.1411	0.1914	0.7373	0.461
Wednesday	0.1979	0.1928	1.0261	0.3050	0.1833	0.1884	0.9729	0.3307
Thursday	0.2927	0.1959	1.4940	0.1353	0.3983	0.1914	2.0816	0.0375*
Friday	0.1800	0.1920	0.9373	0.3487	0.2544	0.1875	1.3565	0.1751
C	0.1851	0.1909	0.9698	0.3323	0.1564	0.1865	0.8385	0.4018
Adjusted R-squared = 0.0058	F-statistic = 1.0528				Adjusted R-squared = 0.0086			F-statistic = 1.5565
D.W. = 1.8752	Prob (F-statistic) = 0.3966				D.W. = 1.7875			Prob. = 0.1053

Source: Computed from PROWESS using E-views. *Significant at 5% level

Outcomes of the study: The following are the important findings of the present study:

- The analysis of the study reveals that there were Positive Mean Returns recorded for all days of the week while the Highest Mean Returns (0.1521 for S and P CNX Nifty, 0.1701 for S and P CNX 500) were recorded on Friday and the Lowest Mean Returns (0.0175 for S and P CNX Nifty, 0.0306 for S and P CNX 500) were recorded on Monday for the sample indices during the study period
- It is suggested that the investors may buy the shares on Monday and sell them on Friday because they may get returns better than on other days of the week
- The Standard Deviation for the mean returns of S and P CNX Nifty Index ranged from 1.56 to 2.12% during the study period. The Highest Value (2.1226) of Standard Deviation was recorded on Monday, with the least mean return and the Lowest Value (1.5687) of Standard Deviation, earned in Tuesday
- This indicates the fact that there was non-linearity between risk and return of S and P CNX Nifty Index in the National Stock Exchange. Hence, the Regulators may take necessary steps to maintain risk and return tradeoff
- According to S and P CNX 500 Index Returns, that there was least Standard Deviation of the return recorded on Thursday and highest on Monday. It implies that the stock market was more volatile on Monday and least volatile in Thursday during the study period
- The Return Distribution was Positively Skewed for Monday (0.114 for S and P CNX Nifty) and Tuesday (0.1231 for S and P CNX Nifty, 0.0042 for S and P CNX 500) while Negatively Skewed for remaining trading days of the week during the study period
- The Kurtosis measure of Returns Distribution was Leptokurtic for all days of the week, showing the Highest Values (15.59 for S and P CNX Nifty, 14.21 for S and P CNX 500) on Monday for the sample indices during the study period. It indicates that the Return Distribution was not normally distributed during the study period
- The analysis of Kruskal-Wallis Statistics shows that the Test Statistic value was lower than the Table value (9.488) at 5% level of significance in 4 degrees of freedom for the selected Index returns. It clearly indicates that there was no significant difference between the returns of different days of the week
- The value of coefficients on Thursday was high and none of the variables was statistically significant at conventional level of risk in S and P CNX Nifty Index Returns. According to S and P CNX 500 Index Returns, the highest value of coefficients was found on Thursday and it was statistically significant at 5% level. But the insignificant F-value did not confirm the Day of the Week Effect in the Indian Stock Market during the study period

CONCLUSION

This study analyzed the Monday Effect for S and P CNX Nifty and S and P CNX 500 Index Returns. The study used the logarithmic data for sample indices in NSE and applied the Dummy Variable Regression Model. The result of the study found that there was the Highest Mean Return earned on Friday and the Lowest Mean Return earned on Monday for sample indices. The Seasonality Results indicate that there were no significant Days of the Week Effect in the Indian Stock Market during the study period. The study further reveals that Monday recorded the lowest returns it was the best period to buy the scrips (buy low). Friday shows high returns and it is the best period to sell the securities (sell high). The findings challenge 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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