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Day of the Week Effect on NSE with Respect to Pharma, Bank, Steel and IT Sector

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Abstract— The main objective of this study is to check the presence of seasonality in stock prices of Indian companies, especially companies of pharma, bank, steel and IT sector. The study is conducted for a period from Jan 01 2010 to Dec 31 2015. The daily closing prices of companies in above mentioned sectors have been taken from Prowess. Using Kruskal Wallis rank test and multiple regression technique the data is analyzed. In this study, seasonality was observed in one company from Pharma and four companies from IT sector. The banking and steel sector stocks as well as a majority of pharma stocks did not show seasonality. These findings on day of the week effects along with its variation within a fortnight suggest that differences in returns exist, but only in some sectors and not in others. These results seem to suggest a more thorough research across all the sectors of Indian stock market in order to unearth more of such seasonality across different days of the week in order to unearth insights on where to focus the short term investment interests.

***Keywords*—** Effiecient Market Hypothesis, Seasonal anomalies, Day of the week effect, Stock returns

I. INTRODUCTION

Stock market prices are difficult to predict because there are so many complex and almost unpredictable factors that have a bearing upon them. This makes it difficult for the investors to make an informed investment. Investors are obviously concerned with the movement of the stock prices. Investors are concerned with the movement of stock prices. Seasonality in stock market is considered to be a major factor that influences the stock price movement. Earlier research has shown that this seasonality is predictable to a significant extent [11][15]The predictability of this seasonal behavior in stock returns may help in forming profitable trading strategies and fair returns. There are many types of seasonality in stock market, namely Weekend effect, January Effect and Day of the Week Effect. Efficient Market Hypothesis states that share prices do not have any pattern i.e. they are random and unpredictable. But study of seasonality in the recent decades has shown that there is some meaningful pattern in stock prices all around the world [12] [13] [14]. This raises question as to whether the intrinsic value of stock, which is one of the central tenets of the Efficient Market theory, has any meaning.

The Efficient Market Hypothesis is a central paradigm in finance. According to this hypothesis, all new information coming into the market in form of the various economic reports, annual corporate financial statements, political and policy developments in the country etc. are rapidly and immediately absorbed by it and get rapidly and accurately reflected in the security prices.. Since all the information reflects on the stock prices there is little room for making an informed decision. Thus, according to Efficient Market Hypothesis there is no possibility to outperform the market through market timing or stock selection. Efficient market theory states that on an average all trading days of the week will have same average returns, but seasonality studies show that there is a significant difference in the returns on different trading days. Therefore, this phenomenon has been appropriately termed as "Day of the week" effect [1].

The stability of the day of the week effect in returns and in volatility – if any – across weeks and across different time periods is studied. The study focuses on Indian context of day of the week effect. One thing which is quite unique in India is that there exists a reporting system in the banking sector of India. All the banks are supposed to make and submit reports of CRR, returns, investment, etc. every other week to Reserve Bank of India (RBI). Based on findings by earlier researchers in different markets, [2] we hypothesize that the day of the week effect could be different for first and second weeks of a fortnight in India. There have been observations showing that there is clear difference in stock returns of reporting and non-reporting week. Normally friday shows positive returns and monday shows negative returns in developed markets all around the world. Some markets didn't show any difference in returns on any day of the week [11]. Focus area of the research is to study whether there is a day of the week effect in multiple sectors, concentrating on companies which show top performance in each sector.

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II. LITERATURE REVIEW

For more than half a century, studies have been done on the behavior of stock prices and their movement in market. There has been extensive research relating to finding a true solution which can help explain whether the stock price movements are random or follow a particular trend. [1] On observing Sensex for a period of 24 years (1973- 1997) it was observed that the highest and lowest returns are received on wednesday and monday respectively. This is the period when NSE originated in India. [2] According to Bhattacharya (2001) the effect is seen through a fortnight rather than a week i.e., stock prices vary across two weeks rather than within a week. This is because of age old practice of reporting of banks to RBI every alternate week. There are positive returns on non-reporting thursday and friday and negative returns on non-reporting monday and reporting wednesday. The results from this research and author suggestions seem to tell that there is a link between banking sector and capital market which might influence the varying stock returns in a week. The day of the week effect is studied for Bank Nifty as a whole and banks traded in that particular index. [3] This is a more recent study where the time period is five years ('06-'10). Based on their study on the NSE they concluded that no day of the week effect exists in Indian stock

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market. It has vanished due to more rational decision making rather than emotional or sentimental decisions. [4][5]These are foreign markets(Australia and Egypt) in nearly the same time periods. Here the Egypt national exchange shows no sign of the effect. But when you take the Australian market it shows partial effects. It had effects in the earlier periods and slowly it has diminished to the current partial state in the following industries: banking, diversified financial, energy, healthcare, insurance, materials and retail industries. [6] The Pakistan market is a whole different story. It is totally different from all other markets. Markets that were exhibiting day-of-the-week effect have slowly reduced or totally gone but when the analysis is done by dividing the data into two time periods the observed results were: no effect found in Sub Period I; while, negative monday and positive friday effects revealed in Sub Period II. Period 1 was from 2004-07 and period 2 from 2008-11 period. Here period 1 corresponded with military rule while the second period was after the military rule. [7] This study was conducted on the Indian stock market. NSE was taken and data collected were analysed using five models and the following conclusions were arrived: no day of the week effect on stock prices. But indices exhibit negative return on friday.

This showed that Indian stock market has reverse day of the week effect. [8][9] Both of these are very recent studies on the BSE Sensex. They both show totally varying results which is the main reason for us going into next step of focusing on particular sectors. In the first study, day of the week effect and monthly effect pattern did not appear to exist in Indian stock market during the study period. But the second study [9] in same time period shows: Positive returns on tuesday. [10] This research is a more focused one. It focuses only on the gas, oil and refineries industries in India. Each company showed different result. The effect was there in each company but day of the effect was different. The companies in this research exhibited day of the week effect. The days which repeatedly showed the effect were tuesday, wednesday or thursday. Only GAIL and HPCL evidenced significant monday effect.

Based on the observations from above papers it can be seen that day of the week effect isn't always exhibited. Sometimes only partially seen or it doesn't show in individual stock returns but only the indices. In some cases, when taking only a particular sector and companies in that sector, the effect is seen. While there are a number of studies showing that Indian stock market (NSE & BSE) is influenced by day of the week effect, some other studies show no such signs or reverse day of the week effect. According to Nabaghan (2012) taking a single sector and looking for the effect will give a more refined result rather than taking whole index as his predecessors have done. So he took the oil, gas and refineries industry. He found that some of the companies in that particular sector showed the effect on different days. Based on results from these researches the main focus is on four different sectors to see the existence of the effect. These sectors are banking, steel, information technology and pharmaceuticals.

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III. RESEARCH METHODOLOGY

A. RESEARCH QUESTION

How does the day of the week effect influence the returns of the stocks of different sectors in India?

B. RESEARCH DATA

The daily stock price data of Nifty has been taken for a period of January 31, 2010 up to December, 31 2015. Daily closing share prices have been taken from PROWESS (the online database maintained by the Center for Monitoring of Indian Economy (CMIE)), which contains information of all actively traded stock at any given time on both BSE as well as NSE. This data is chosen because it will help to find whether the effect is there in recent times. Research done in this time period will let us know if the effect still exists in Indian stock market.

The daily return for sequential working days viz., Monday-Tuesday, Tuesday-Wednesday, Wednesday-Thursday, Thursday-Friday, and Friday- Monday were calculated using the following expression:

$R_n = (C_n - C_{n-1})/ C_{n-1}$ Where, R_n= Return of the nth Day

C_n= Closing price for nth day

C_{n-1}= Closing price for (n-1)th day

Kruskal Walis test was used to see if any significant difference exists in average daily returns across weekdays. The Kruskal Wallis test was applied for both the cases. After the rank test if there is a significant difference between returns of the days then following expression was used in order to find which day has what kind of returns.

$W = \alpha + \beta_2 Dtues + \beta_3 DWed + \beta_4 DThu + \beta_5 DFr + \varepsilon t$

MS excel and STATA 12 was used to carry out the analysis.

C. HYPOTHESIS

1) H_0: There is no significant impact of weekdays on returns of companies in banking Sector

H_n: There is a significant impact of weekdays on returns of companies in banking Sector

2) H_0: There is no significant impact of weekdays on returns of companies in pharmaceutical sector

H_n: There is a significant impact of weekdays on returns of companies in pharmaceutical sector

3) H_0: There is no significant impact of weekdays on returns of companies in steel Sector

H_n: There is a significant impact of weekdays on returns of companies in steel Sector

4) H_0: There is no significant impact of weekdays on returns of companies in IT Sector

H_n: There is a significant impact of weekdays on returns of companies in IT Sector

Variables:-

Independent variable(X) – Day of the week

Dependent variable(Y) – Stock returns

D. Figures and Tables

Table I, II, III and IV are showing the rank test results of four industries, namely banking, steel, pharmaceutical and information technology respectively. Most of the top performing companies of these industries are not showing any difference in their returns. Only one industry (IT) exhibited difference in returns for different days apart from one company from pharmaceutical sector (Dr. Reddy's).

TABLE I BANKING SECTOR

Company name	Chi-square	Probability
Axis bank	1.809	0.7709
Bank of Baroda	2.763	0.593
HDFC bank	3.355	0.5003

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ICICI bank	2.125	0.7128
Indusind bank	1.856	0.7621
KotakMahindra bank	1.239	0.8717
Punjabnational bank	5.076	0.2795
State bank of India	0.056	0.9996

The table V consists of the companies which have significant difference in returns for different days. The table VI shows which days show these differences for each company. The above results show that there is a presence of day of the week effect in companies of IT sector and a one Pharmaceutical company. According to table VI, Dr. Reddy's has positive returns on friday. The same result is also exhibited by Infosys. TCS and HCL show negative returns on monday. But there are other weekdays where there is a positive return. For TCS it's tuesday and for HCL it's wednesday and friday. Tech Mahindra has positive stock returns on friday.

TABLE II STEEL SECTOR

Inter day		
Company name	Chi-square	Probability
Hindal	5.32	0.5035
Sail	4.332	0.6318
Tata	3.992	0.6778

TABLE III PHARMA SECTOR

Inter day		
Company name	Chi-square	Probability
Cadila	6.105	0.4116
Cipla	9.032	0.1718
Piramal	4.836	0.5651

TABLE IV IT SECTOR

Company name	**Chi-Square**	**p-value**
TCS	11.348	0.0229
Tech Mahindra	11.292	0.0235
Infosys	8.02	.0448
HCL technologies	13.095	0.0108

TABLE V COMPANIES EXHIBITING DIFFERENCE IN RETURNS

Company name	**Chi-Square**	**p-value**
Dr. Reddy	**17.37**	**.0014**
TCS	11.348	0.0229
Tech Mahindra	11.292	0.0235
Infosys	8.02	.0448
HCL technologies	13.095	0.0108

TABLE VI OLS REGRESSION

Company	Constant	D2	D3	D4	D5	R square	F/P value
Dr.Reddy	.001034	.001508	.000249	-.000396	.002885*	0.18	3.25/.011
Tcs	.0028*	0.00425*	0.00421	0.00156	0.00403	0.34	2.57/.036
Infosys	.000764	-.000015	.001352	-.001823	.004578*	0.26	4.61/.001
Tech Mahindra	.000046	.001221	.002010	.003726*	.00068	0.19	1.85/.012
HCL	-.0025*	.003252	.005737*	.0028441	.00422*	0.24	3.15/.013

IV. CONCLUSION

There is a presence of day of the week effect in companies from IT sector and one pharmaceutical company while there is no day of the week effect in banking and steel sectors. The negative monday effect may be because of companies releasing bad news on Friday after the market closes. The positive returns on later days of the week are perhaps based on improved sentiment of investors towards end of the week. This anomaly in stock returns on different days of the week thrown up by our study may help investors to use varying returns and gain profits. This positive Friday effect and negative monday returns have been observed in lot of markets and have been studied. The investors who may be benefited by this research are short term investors, who try to use arbitrage opportunity that arises due to difference of returns on each day. Further this study can be extended in other unexplored sectors as a future work.

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