Analysis of Weekday Effect in Sectoral Indices: A Stock on National Stock Exchange

Tajinder Jassal[1] and Babli Dhiman[2]

[1]*PhD, Research Scholar, Mittal School of Business, Lovely Professional University, Punjab. Email: tajinderjassal2@gmail.com**

[2]*Associate Professor, Mittal School of Business, Lovely Professional University, Punjab. Email: babli.dhiman@lpu.co.in*

ABSTRACT

Efficient market hypothesis decides the patterns of returns from the stock Market. Study will contribute in the area by re-examining the phenomena of calendar anomalies for stocks of eleven different sectors. The Analysis of stocks of eleven sectors provide us very interesting results in the area of calendar anomalies. It is clear from the results that there is Friday effect in both banking and Private sector banking Indices. Wednesday is found positive and significant for FMCG and Pharma Sector returns. Monday and Tuesday returns are positive and significant for FMCG and Private sector banking indices. Other Sector follows random walk behavior and there is no negative Week day in the market. All those evidence shows sector specific behavior of stock market and "Day of the week effect" is still present in the stock market.

Keywords: Stock Market Returns, Information and Market efficiency, "Day of the week effect", GARCH.

1. INTRODUCTION

An anomaly in general means abnormal or unfamiliar happening. Wachtel (1942) estimated that the sentiment of good fellowship and cheerfulness connected with this festive juncture may spill into the stock market. They are the unexpected or abnormal regularities in security returns. However In other words anomalies are observed outcomes different from already existing notions of asset pricing behavior. These are either market inefficiency or shortfalls in underlying asset pricing model. Stock market anomalies are empirical conclusions that cannot stand described through extensively recognized financial theories. It becomes extremely important to study stock "market anomalies" because that can highly expand the Knowledge of financial markets. In contemporary world several challenges to market efficiency came to existence, few of them are size effect, the weekend effect and momentum effect. All these challenges are known as

stock market anomalies and the shortfalls in model for testing market efficiency. "Anomalies" are taken as unfamiliar or unusual event among non-investing groups however for shareholder it is condition where "stock market" performs against the efficient market hypothesis. Every examination of "Market efficiency" is a twofold one one-hand it examines the market efficiency on other hand it also test the expected model of revenue generation. Specific persistence, regular and apparent market inefficiencies are termed as "Anomalies". Notion of Market efficiency proposes that every security is valued efficiently to fully reflect all the information in security prices. However, calendar effect leads to greater or lesser earnings based on the time series. Conclusively when stock yields exhibits certain empirical regulations which are challenging to describe using already established asset evaluation theories, they are called stock market anomalies. Bonin and Moses (1974) studied the seasonality in US stock market using data of 30 individual stocks and found seasonality in 7 stocks out of total 30. Reinganum (1984) investigated that size effect with January anomaly. It was found that small firm had shown the tendency to provide bulky returns in the month of January especially in first few trading days of January. Lakonishok and Smidt (1984) inspected the trading features of companies listed by size. They also tested performance of stocks at turn of year. It was found that there were no trades on nearly twenty five percent of the days for the smallest corporations at the end of year. However "Turn of year" was dynamic transaction period for small cap stocks. As a consequence of prices of small cap enterprises required some days to completely replicate equilibrium price changes. All those hurdles leads to create seasonal pattern in rates of return for small Cap Stocks. They also raised doubt that there may be a seasonal pattern for stocks of big corporations as well. Hansen et. al., (2005) studied calendar effects in equity returns and contribute to the calendar effects literature by applying new approach to test for calendar effects. They implemented bonferroni bound test and bootstrapping methods to stock indices from 16 countries from three continents. Bootstrap *p*-values reveal that calendar effects was significant for returns in most of these equity markets, but end-of-the-year effects was predominant. They calendar effects had been diminishing except in small-cap stock indices. This study was one of the few studies on week-of-the-month, weekday-of-the-month, and week-of-the-month-of-the-year effect in stock market.

Day of the Week Effect

Day of the week effect means the returns from particular day are higher than the normal. Information irregularity in the market are the cause for "day of week" effect. Recently there were the finding that weekend effect was either moving to other days, reversing or vanishing. Lakonishok and Maberly (1990) analyzed weekend effect in US stock market. They applied *t*-test and descriptive statistics to explain the phenomena. It was found that there was selling pressure in the stock market on Monday from individual investor side. They also found lowest trading volume on Monday. It was also established that selling trades on Monday were higher than buy trades on that particular day. Abraham and Ikenberry (1994) examined "day of week" effect" in the stock market. Previous research in the area found that the activities of individual investor were the reason for the phenomena. However it found that there was positive relation between previous day returns and current day returns. They also raised doubt that information irregularity in the market might be the cause for "day of week" effect. They also found that this pattern was more acute in small and medium size firms. Amanulla and Thiripalraju (2001) analyzed Friday effect in an Indian stock market. They applied ordinary least square regression on seven portfolio's out of which three were Index portfolio and four were beta portfolio. They also divided the whole period into five parts depending on carry forward transaction

law. It was found that the during ban on carry forward transactions Friday effect was present but this effect shifted to Wednesday during modified period and revised carry forward transaction period. Further this research also documented the reversal of Friday effect being positive return on Monday whereas negative on Friday. He and Tang (2010) examined day of the week and weekend effect in Shanghai Stock Exchange. He used Mann-Whitney U-Test, Kruskall-Wallis and descriptive statistics to explain the phenomena. It was found that the mean returns of Monday were significantly higher than other days of week. However there was no weekend effect found in China. They also reported that the bear and bull market could be the reason of change in "Day of the week effect". Silva (2010) analyzed the calendar anomalies in stock market of Portugal. He used ordinary least square regression, Kruskall-Wallis test and descriptive statistics. It was found that there was no Monday or weekday effect in stock market. January anomaly was found absent but monthly anomaly was identified in Portuguese stock market. He also found evidence for significant holiday effect in stock Market. Philpot and Peterson (2011) examined the past research on the weekend effect to develop new theoretical foundations. He found that the earlier research on weekend effect was consistent where they document positive returns on Friday and Negative return on Monday. However finding of recent research had challenged the phenomena of weekend effect because recent research reported that the weekend effect was either moving to other days, reversing or vanishing. Nageshwari et. al., (2011) examined the calendar effect in stock market using Monday effect as proxy for calendar effect. She used descriptive statistics, Kruskall - Wallis and ordinary least regression. It was found returns were higher on Friday whereas lower on Monday. However these returns were not statistically significant. It was also reported that stock returns were not significant on any day week. Therefore it could be concluded that there was no seasonality in market. Guidi et. al., (2011) examined efficient market hypothesis for central and Eastern Europe. They used GARCH model, Autocorrelation, Runs Test. Variance Ratio test. It was found that "Day of the week effect" was not present in most of countries of central and Eastern Europe except few. It means European stock Markets were efficient. However investor can make the profits based on past prices. Deepak and Viswanath (2012) analyzed the movement of stock prices in India. It was found that Day-of-the-week effect was present in the NSE NIFTY returns where Wednesday, Thursday and Friday were found statistically significant. Jassal and Dhiman (2015) confirmed that the stock market is not homogeneous and calendar anomalies varies from large sector to small sector stocks.

Data Collection and Estimation of Empirical Model

Data has been taken for the period of 2007 to 2016 from National Stock Exchange. Eleven stock indices are used to represent eleven different sectors. These sectors include Auto, Bank, Energy, Finance, FMCG, IT, Pharma, Media, Metal, PSU banks and Reality Sector.

Research Methodology and Empirical Model

Day of the effect is examined using dummy variables in the model D_1, D_2, D_3, D_4, D_5 representing "Monday, Tuesday, Wednesday, Thursday, Friday". For examining the "Day of the week effect" we have taken all the day in model without Constant term. It is done to deal with problem of Dummy trap and multicollinearity. The presence of "Day of the week effect" will established when coefficient of at least one of the dummy variable is statistically significant.

$$R_t = \beta_1 D_1 t + \beta_2 D_2 t + \cdots + \beta_5 D_5 t + \varepsilon_i \qquad (1)$$

R$_t$ is the daily logarithmic return of the index calculated as following:

$$R_t = (P_t/P_{t-1}) \times 100$$

where, R$_t$ will be the return on respective index

P$_t$ = Closing value of Index for day (*t*)

D$_1$ − D$_5$ are Daily dummy variable for daily returns, e is the error term in regression equation it is normally distributed with mean zero.

Earlier researcher has used dummy variable ordinary least square regression but that statistical tool gives erroneous results and contains shortcoming of error term being not regular over the long period of time. To overcome this shortcoming Variance is modeled to deal with problem of heteroskedasticity. In 1982 Eagle developed the model to deal with the problem heteroskedasticity which is written as following equation and known as ARCH model.

$$h_t = c + \alpha \, \varepsilon_{2t-1} + \varepsilon_i$$

Later on Bollerslev (1986) comes out with generalized Model of ARCH known as GARCH. In this study we have used GARCH model with mean equation.

$$h_2 t = c + \alpha \, \varepsilon_{2t-1} + y h_{2t-1} + \varepsilon_i \qquad (2)$$

2. RESULTS AND ANALYSIS

Following table shows the results of GARCH model for eleven sectors using equation (1) and Equation (2) to check whether there is "Day of the week effect" in the market or not. These results will also reflect whether these anomalies are homogeneous for whole stock market or It changes from sector to sector.

Table 4
Analysis of Day of the week effect using Equation (1) and (2)

	Variable	MON	TUES	WED	Thu	FRI	RT(-1)		ARCH	GARCH
Auto	Coff.	0.07	0.06	0.10	0.05	0.10	0.13	Variance	0.08	0.90
	Prob.	0.22	0.29	0.09	0.37	0.07	0.00		0.00	0.00
Bank	Coff.	0.11	0.00	0.05	0.05	0.14	0.10	Variance	0.06	0.93
	Prob.	0.11	0.98	0.46	0.52	0.02	0.00		0.00	0.00
FMCG	Coff.	0.04	0.15	0.10	0.04	0.02	0.00	Variance	0.08	0.87
	Prob.	0.35	0.00	0.05	0.42	0.76	0.00		0.00	0.00
IT	Coff.	0.04	0.06	0.16	-0.02	0.08	0.00	Variance	0.13	0.81
	Prob.	0.58	0.36	0.01	0.72	0.13	0.00		0.00	0.00
Media	Coff.	0.07	-0.01	0.13	0.01	0.00	0.07	Variance	0.07	0.90
	Prob.	0.24	0.84	0.05	0.85	0.97	0.00		0.00	0.00
Metal	Coff.	-0.01	-0.03	0.09	-0.02	-0.02	0.08	Variance	0.08	0.90
	Prob.	0.94	0.68	0.25	0.83	0.83	0.00		0.00	0.00
Pharma	Coff.	0.06	0.04	0.15	-0.03	0.08	0.00	Variance	0.05	0.94
	Prob.	0.18	0.40	0.00	0.56	0.07	0.00		0.00	0.00

(Contd...)

	Variable	*MON*	*TUES*	*WED*	*Thu*	*FRI*	*RT(-1)*		*ARCH*	*GARCH*
Private	Coff.	0.15	0.04	0.09	0.06	0.16	0.10	Variance	0.08	0.91
	Prob.	0.03	0.55	0.20	0.37	0.01	0.00		0.00	0.00
Reality	Coff.	-0.02	-0.06	0.05	-0.06	-0.01	0.13	Variance	0.09	0.88
	Prob.	0.84	0.56	0.63	0.59	0.94	0.00		0.00	0.00
PSU	Coff.	0.10	-0.07	-0.01	-0.02	0.14	0.11	Variance	0.07	0.91
	Prob.	0.23	0.44	0.94	0.85	0.08	0.00		0.00	0.00
Finance	Coff.	0.01	0.08	0.00	0.10	0.12	0.05	Variance	0.01	0.99
	Prob.	0.93	0.27	0.96	0.11	0.12	0.03		0.00	0.00

Efficient market hypothesis decides the patterns of returns from the stock Market. Therefore market efficiency is one of the decisive factor for Investment opportunities in the "stock Market". There were numerous studies on market efficiency Indian stock market. Maximum studies in the area treat the stock Market as Homogeneous and try to relate the results of Base Indices with overall stock market efficiency. However we have collected some recent International evidence that the stock market is not homogeneous and there anomalies are different for different kind of stocks. Therefore the study will contribute in the area by re-examining the phenomena of calendar anomalies for stocks of eleven different sectors. Table (4) shows the results of equation (3) equation (4) for "Day of the week effect" in eleven sectoral stocks. Returns from banking sector on Friday (0.14), FMCG on Tuesday (0.15), IT sector stocks on Wednesday (0.16), Pharma sector on Wednesday (0.15). Private Sector on Monday (0.15) and Friday (0.16) were found positive and statistically significant at five percent level of Significance. Returns Auto, Media, Metal, Reality, PSU and Finance sector were not found statistically significant. Evidence shows the presence of "Day of the week effect" in an Indian Stock Market. However "Day of the week effect" is not present in all the sectors. It could be possible that the Indian stock market is getting efficient. However Monday and Friday effect is still present in private banking sector and it is possible that Monday returns could be Accumulated Saturday and Sunday returns. Friday Anomaly is only present in banking sector all sectors however PSU banking sector is exception to the phenomena. It might possible that investor might want to invest in the stock market on information's available to him during whole week before the start of next week. Wednesday is also found positive and significant at 5% level of significance for IT and Pharma Sector returns. Tuesday is found positive only in FMCG sector. Media Sector follow random walk behavior as there is no "Day of the week effect". There is no negative weekday effect in stock market. ARCH and GARCH effect was found present in almost all the sectors indicating the strong effect of previous period News on current stock prices as well volatility. AR term was also significant for all the sectors except financial sector indicating significant relationship of current returns with previous period returns.

3. CONCLUSION

Efficient market hypothesis decide the patterns of returns from the stock Market. Therefore market efficiency is one of the decisive factor for Investment opportunities in the stock Market. There were numerous studies on market efficiency Indian stock market. Maximum studies in the area treat the stock Market as homogeneous and try to relate the results of Base Indices with overall stock market efficiency. However we have collected some recent International evidence that the stock market is not homogeneous and these anomalies are different for different kind of stocks. Therefore the study will contribute in the

area by re-examining the phenomena of calendar anomalies for stocks of eleven different sectors. The Analysis of stocks of eleven sectors provide us very interesting results in the area of calendar anomalies. It is clear from the above that the returns from the Private sector banking on both Monday and Friday are positive and significant at level of significance. It is also observed that there are significant returns on Friday. It could be possible the Monday returns could be accumulated Saturday and Sunday returns. Friday Anomaly is might be occurring because the investor might want to invest in the stock market on information's available to him during whole week before the start of next week. Wednesday is also found positive and significant for FMCG and Pharma Sector returns. Tuesday is found positive only in FMCG sector. Other Sector follows random walk behavior as there is no "Day of the week effect". There is no negative Week day in any of the sector. All those evidence shows sector specific behavior of stock market and "Day of the week effect" is still present in the stock market.

Researcher has studied the "Day of the week effect" in National Stock exchange. However same studied could be conducted for Stock exchanges. This study has consider only daily dummies to study the random walk behavior of Indian stock market. Inclusion of other variables Inflation, Interest rate can bring new insights in the area. It is also possible to study how these anomalies are changing the behavior of actual Investors and other stakeholders.

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