



An Analysis of turn of the month effect on S&P BSE Healthcare Index in the Indian Stock Market

Dr. G. LalithaKumari

Research Guide, Bharathiar University,
Coimbatore, India

Uthra.V

MBA.,Ph.D, Research Scholar, Bharathiar
University, Coimbatore, India

ABSTRACT

The presence of the seasonal or monthly effect in stock returns has been reported in several developed and emerging stock markets. The Efficient Market Hypothesis (EMH) suggests that asset prices reflect on all obtainable information (Fama,1970). However, many studies have accepted not only that stock prices are predictable based on the preceding information, but also that indicators such as dividend yields, and gross domestic product contain information that is useful in predicting stock prices. This evidence is commonly called calendar anomalies. Calendar anomalies refer to the tendency of stock market returns to show systematic patterns at a certain time of the day, week, month or year. The existence of the calendar anomalies is a denial of the weak form of efficient market hypothesis which states that the stock returns are time invariant. This paper provides a new and economically plausible explanation for turn-of-the-month anomaly. It covers the post reform period. The study uses the monthly return data of the BSE healthcare Index from 1 April 2002 to 31 March 2016 for analysis. After examining the stationarity of the return series, we specify a linear regression model to find the turn of the month effect. The results confirm the existence of seasonality in stock returns in India. The findings are also consistent with the 'tax-loss selling' hypothesis. The results of the study imply that the stock market in India is inefficient, and hence, investors can time their share investments to improve returns. We find that the turn-of-the-month effect still exists, but its occurrence has moved to earlier dates. We also find that investment made on days before the turn-of-the-month performs better than those made

during the turn-of-the-month. Simple time diversification strategy of spreading investment throughout the month, which doesn't require a perfect foresight, is also found to generate a better performance.

Keywords: Turn of the Month effect, healthcare Index, Stock returns, Linear Regression, Strategy

1. INTRODUCTION

Stock market plays a pivotal role in transaction of stocks which provides data for prediction of price movement of securities. A stock market is a market for the trading of stocks and shares in companies and derivatives of company stocks at an agreed price. The topic of capital market efficiency is amongst the most researched areas in finance. Investors want to predict the market to earn more returns on their investments. During the development of Indian stock market, researchers have tried to find whether the Indian stock market is efficient or not. **The stock market has direct influence of the money along with information there in. The prices of financial assets at a point of time reflect the expectations of investors, which are shaped mainly by the available information.** Capital markets are considered efficient informationally. The weak form of market efficiency states that it is not possible to predict stock price and return movements using past price information. Following Fama (1965; 1970), a large number of studies were conducted to test the efficient market hypothesis (EMH). These studies

generally have shown that stock prices behave randomly. More recently, however, researchers have collected evidence contrary to the EMH. They have identified systematic variations in the stock prices and returns. The significant anomalies include the small firm effect and the seasonal effect. The existence of the seasonal effect negates the weak form of the EMH and implies market inefficiency. In an inefficient market investor would be able to earn abnormal returns, that is, returns that are not commensurate with risk.

Financial market anomalies are cross-sectional and time series patterns in security returns that are not predicted by a central paradigm or theory. A great deal of research has been devoted to the investigation of the randomness of stock price movements in order to judge the informational efficiency of stock markets. There are a large number of anomalies documented by researchers and still continues to grow. In which some important or famous market anomalies are calendar anomalies and fundamental anomalies. Anomalies that are linked to a particular time are called calendar effects. This time may be an hour of the day, or a day of the week or a week of the month or a month of the year etc. Calendar effects in stock markets have always been a challenge for finance economists; as these are difficult to explain with in standard framework of financial economics. Predictable patterns in stock prices are inconsistent with the efficient market hypothesis. Therefore, researchers have shown great interest in the study of Calendar anomalies – finding them and trying to understand them in light of the market frictions and behavioural imperfections. 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.

The trend of stock prices to increase during the last two days and the first three days of each month is called the Turn of the Month Effect. For this study, the average returns on the last two trading days of the preceding month, and the first three days of the subsequent month were computed and compared with the mean return for the rest of the days in the subsequent month. India has played a key role in Information Technology (IT) industry in the worldwide, accounting for approximately 67 per cent of the US\$ 124-130 billion market. IT industry has been one of the key development providers to the

Indian economy. The IT industry employs more than 10 million Indians to contribute deliberately to bring out social and economic change in the country. The IT industry has played a key role in renovating India's image from a slow moving bureaucratic economy to a land of innovative entrepreneurs and a worldwide player in providing world class technology solutions for commercial services. The industry has helped India to transmute to knowledge based economy from a rural and agriculture-based economy. Information Technology has made probable evidence access at gigabit speeds. It has made remarkable impact on the lives of millions of people who are poor, living in rural and far flung landscapes. The Internet has made radical changes with the potentials of e-government measures like e-health, education, e-agriculture, etc. The IT-BPO sector in India grew at a compound annual growth rate (CAGR) of 25 per cent over 2000-2013, which is 3-4 times higher than the worldwide IT-BPO spend, and is probable to expand at a CAGR of 9.5 per cent to US\$ 300 billion by 2020. The BSE Healthcare index provides investors and market intermediaries with an appropriate benchmark that captures the performance of the Indian IT companies.

1.1 Turn of The Month Effect

The turn-of-the-month effect refers to the unusually high stock returns at the turn of the month defined as the period from the last trading day of the previous month to the first three trading days of the current month. It refers to the stock return that is abnormally high for some specific trading days within a month. It has been observed that a positive rate of return occurs only in the first half of the month beginning from the last few days of the previous month. This implies that average daily returns of stocks on turn of the month are different from the average daily returns in rest of the month.

2. REVIEW OF LITERATURE

1. **P. Nageswari, Dr. M. Selvam and Dr. J. Gayathri (2011)¹** in their research entitled “**An empirical analysis of Semi-Month and Turn of the Month effects in Indian stock market**” investigated the Semi-month and Turn of the month effects in an

¹P. Nageswari, Dr. M. Selvam and Dr. J. Gayathri (2011), “An empirical analysis of Semi-Month and Turn Of the Month effects in Indian stock market”, International Journal of Research in Commerce, Economics & Management, Vol.1, Issue.3, pp.104-112.

emerging Indian Capital Market. The S&P CNX Nifty and BSE Sensex Index data have been collected and analysed for a period of six years from 1 January 2005 to 31 December 2010. OLS Regression Model was used for analysis to examine the semi-month and Turn of the month effect. The analysis of the selected indices (BSE Sensex and S&P CNX Nifty) showed that highest mean returns was recorded for the first half month than the rest of the days of the month. The study revealed that the semi-month effect does not exist in BSE Sensex and S&P CNX Nifty index returns during the study period. The study found that there was inverse relationship between risk and return of the series i.e. high (low) return was associated with lower (high) risk. The existence of these anomalies may provide opportunities to formulate profitable trading strategies so as to earn the abnormal return.

2. Huson Joher Ali Ahmed and ZiaulHaque(2007)² in their paper entitled “The day of the week, turn of the month and January effect on stock market volatility and volume: Evidence from Bursa Malaysia “focused on three important calendar events namely day of the week, turn of the month and January effect. Using both a GARCH (1 1)-M model and a mixture of distribution hypothesis (MDH) this paper investigated the return and conditional volatility pattern of the Malaysian stock index over the period from 1994 to 2004. In an attempt to isolate the effect of the 1997 crisis, the sample period was divided into three sub periods namely “pre-crisis”, “during crisis” and “post crisis”. Findings indicated the presence of a weekend effect suggesting Monday returns to be significantly negative across the three sub periods and provide strong explanation for both return volatility patterns on Malaysian capital market. No clear pattern of January or turn of the month effect was observed in the study. However, when the sample period is subdivided based on economic conditions, the turn of the month effect is found to be positive and significant for the pre crisis period and negative for post crisis period. The January effect appeared to be present in the post crisis period only. The findings implied that the behavioral pattern of Malaysian traders has been changed since the 1997 Asian crisis period.

²HusonJoher Ali Ahmed and ZiaulHaque(2007), “The day of the week, turn of the month and January effect on stock market volatility and volume: Evidence from Bursa Malaysia”, SSRN Working Paper Series(Electronic copy available at: <http://ssrn.com/abstract=1460374>).

3. William S. Compton, Don T. Johnson and Robert A. Kunkel (2006)³ in their research paper entitled “The turn-of-the-month effect in real estate investment trusts (REITs)” examined the market returns of five domestic real estate investment trust (REIT) indices to determine whether they exhibit a turn-of-the-month (TOM) effect. Daily returns are obtained from January 1999 to December 2003 for all indices except the real estate 50 REIT, which has daily returns starting in January 2000. A series of parametric and non-parametric statistical tools were used to determine the existence of turn of the month effect. An OLS regression model compares the TOM returns with the rest-of-the-month (ROM) returns and an ANOVA model examines the TOM period while controlling for monthly seasonality. A non-parametric t-test examines whether the TOM returns are greater than the ROM returns and a Wilcoxon signed rank test examines the matched-pairs of TOM and ROM returns. The findings revealed that TOM effect in all five domestic REIT indices were found: real estate 50 REIT, all-REIT, equity REIT, hybrid REIT, and mortgage REIT.

4. McGuinness (2006)⁴ in his study entitled “Turn of the month anomalies-a global research on small, mid and large cap indices” attempted to examine the existence of TOM effect in order to gain more generalized and global knowledge of the behavior of the TOM effect anomaly. Of the selected 20 countries the study has tried to extract three index types: Large cap, mid cap and small cap, from 1 January 1988 until 29 December 2006. Both parametric and non parametric test has been employed in this study. The study conducted 2 parametric tests, and a non-parametric test, on each of the three chosen indices from each country. The parametric test used for the study is a simple linear regression and a one-way ANOVA test and the non-parametric test is a Wilcoxon signed rank (WSR) test. The conclusion of these 3 tests found TOM effect exists in each index in each country.

³ William S. Compton, Don T. Johnson and Robert A. Kunkel (2006), “The turn-of-the-month effect in real estate investment trusts (REITs)”, *Managerial Finance*, Vol.32, Iss.12, pp.969 – 980.

⁴McGuinness (2006), “Turn of the month anomalies-a global research on small, mid and large cap indices”, *Financial Analysts Journal*, Vol.62, Issue.5, pp.78-89.

5. Eleftherios Giovanis (2006)⁵ in his study entitled “The turn-of-the-month-effect: Evidence from Periodic Generalized Autoregressive Conditional Heteroskedasticity (PGARCH) Model” investigated the turn of the month effect in stock market indices around the globe (20 countries) for the period of 1990 to 2013 and to test its pattern, which can be used for the optimum asset allocation with result the maximization of profits. Ordinary Least Squares (OLS) is problematic as it leads to unreliable estimations because of the autocorrelation and Autoregressive Conditional Heteroskedasticity (ARCH) effect existence. Due to this reason Generalized GARCH models was estimated. Two approaches are followed in this study. The first is the symmetric Generalized ARCH (1,1) model. However, previous studies found that volatility tends to increase more when the stock market index decreases than when the stock market index increases by the same amount. In addition there is higher seasonality in volatility rather on average returns. For this reason the Periodic-GARCH (1,1) is estimated. The findings revealed positive returns at the beginning of the month and zero returns in the latter part of the month. Thus, investors can improve their returns by timing their investment.

3. STATEMENT OF THE PROBLEM

The trading of securities had gained more popularity with increase in investment patterns and volume of trade. No market expert can predict exactly the timings for buying and selling of shares, though the technical software can provide support and resistance levels in the chart for the current term. The corporate, firms and Government generally release good and bad news between First half month and last half Month respectively. As a result, the bad news is reflected in lower the stock prices and good news is reflected in higher stock prices. 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 the process, observed anomalies will eventually

disappear and pave the way to make the market more efficient. The study attempts to understand the existence of market anomalies in the Indian Stock market. Therefore, we need to examine whether turn of the month anomaly persist for a long period and if investors based on this seasonality are able to make profits. The present study will be useful to the investors, traders and arbitrageurs who could formulate profitable trading strategies if they were able to predict the share price behaviour with full information on these anomalies.

4. THE PURPOSE OF THE STUDY

The effect of Calendar Anomalies may scramble or depress the share price on a particular day/week or month as compared to the mean. Traditional asset pricing models cannot explain the changes in the price and the changes also violate the Weak Form of Market Efficiency (i.e. asset prices fully reflect all past information). Recent liberalization policies have led to significant capital flows into India seeking to capitalize on promising and profitable business opportunities. As a result, International Investors are concerned with the market efficiency, timing of investment, and the market integration with other developed countries. We need to examine whether there is calendar anomalies in stock returns persist for a long period and if investors based on this seasonality are able to make profits. According to efficient market hypothesis, it is not allowable for someone to use strategies based on seasonality in order to have profits. EMH also states that no investing group has the ability to have excessive returns for a long period. The present study would be useful to the investors, traders and arbitrageurs who could formulate profitable trading strategies if they were able to predict the share price behavior with full information on these anomalies. The share price behavior in one market spreads slowly to the other developing and developed markets. As research on seasonality is still at a nascent stage, the current study could possibly help in understanding and explaining such seasonality in the Indian capital markets. The presence of Calendar Anomalies in stock markets across the country is widely reported and these anomalies should be investigated in India. The detailed investigation of the Calendar Anomalies in the Indian Markets would help the international and Indian investors to plan their investment. The periodical study of this nature is of use to all types of users, including market participants. The purpose of the research is to review, integrate and extend the

⁵Eleftherios Giovanis (2006), “The turn-of-the-month-effect: Evidence from Periodic Generalized Autoregressive Conditional Heteroskedasticity (PGARCH) Model”, SSRN Working Paper Series (Electronic copy available at: <http://ssrn.com/abstract=2479295>).

studies of stock market anomalies and to understand the trading strategic formulation on the basis of Calendar anomalies for the utmost benefit of the investors.

5. OBJECTIVES OF THE STUDY

- To test the existence of turn of the month effect in the BSE index
- To test the efficiency of the stock market.
- To develop trading strategy for investors based on the calendar effects.

5.1 Hypothesis of the Study

The following Hypotheses was developed and tested.

H01: There is no significant difference in the mean monthly returns of turn-of-the month and rest-of-the month

6. METHODOLOGY OF THE STUDY

The tendency of stock prices to increase during the last two days and the first three days of each month, is called Turn of the Month Effect. For the purpose of this study, the average of the return on the last two trading days of the preceding month, and the first three days of the subsequent month were computed and compared with the mean return for the rest of the days in the subsequent month (Bodla BS, Kiran Jindal 2006).

6.1 Period of the Study

The Compulsory Rolling Settlement System was introduced by SEBI on January 02, 2002 in the stock exchange. It reduces the market risk of stocks to a considerable extent. The investors get their money / securities much faster, thus enhancing their liquidity. The introduction of Rolling Settlement leads to high turnover and creates impact on the Anomalies Behaviour of stock. Thus, an attempt has been made in this study, to identify the turn of the month Anomaly in the Indian Stock Market during the Post Rolling Settlement Period from April 2002 to March 2016. Hence the period of present study covers a period of **14 years from 1April 2002 to 31March 2016** (i.e. Post Rolling Settlement Period).

6.2 Sources of Data Collection

The main sources of data are given below:

- Financial Dailies:

- (i) The Economic Times, India
- (ii) Financial Express, India.

- Journals / Magazines:

- (i) Business India
- (ii) Capital Market
- (iii) Dalal Street
- (iv) Economic and Political Weekly
- (v) Fortune (Asia Edition)

- CAPITALINE DATABASE (the online database maintained by the Capital Market Publishers India Private Limited);

- CAPITACHART DATABASE (the online database maintained by the Capital Market Publishers India Private Limited);

- PROWESS DATABASE (the online database maintained by the Center for Monitoring of Indian Economy- CMIE);

- Websites:(i) Website of Bombay Stock Exchange : www.bseindia.com

6.3 Sample of the study

To study the seasonal behaviour of stock prices, the sample selected is S&P BSE Healthcare index. The data constitutes daily data and the sample period of the study spans from 2002 to 2016. The literature shows that researchers have used only closing prices. Rather average of these four prices can yield better results as it can control volatility up to some extent. Hence, in this study **daily close, open, high and low prices** were considered.

6.4 Software Packages

We have used SPSS 15.1 for the primary analysis of the data. EVIEWS 9 has been used for the econometric modelling.

6.5 Tools Used for Analysis

- (i) The daily **close, open, high and low prices** of the respective stocks have been taken and average price is calculated and then logarithm return of these prices has been calculated.
- (ii) After finding the return, the next step is to check for the normality of the return using the summary statistics like Arithmetic Mean, Standard Deviation, Skewness, Kurtosis and Jarque- Bera test. If the Mean and Median are approximately equal, Skewness is zero, Kurtosis is around three and if the Jarque-Bera value is significant, then it is interpreted that the series follow normal distribution.

- (iii) **Linear Regression Model** is a standard methodology that is initially employed to test the Turn-of-the Month Effect.

Table 1.1 The Results of Descriptive Statistics for S&P BSE Healthcare index Daily Returns - Turn of the Month wise from April 2002 to March 2016

Statistics	First Half	Second Half
Mean Return	0.2846	0.0888
Standard Deviation	2.7860	1.4921
Sample Variance	7.7619	2.2265
Kurtosis	19.3898	9.2756
Skewness	-1.9689	0.3924
Range	39.3437	22.1775
Minimum	-25.9168	-9.4277
Maximum	13.4269	12.7498
Sum	239.1039	235.1337
Count	840	2647

Source: Computed using Ms.-Excel

7. ANALYSIS

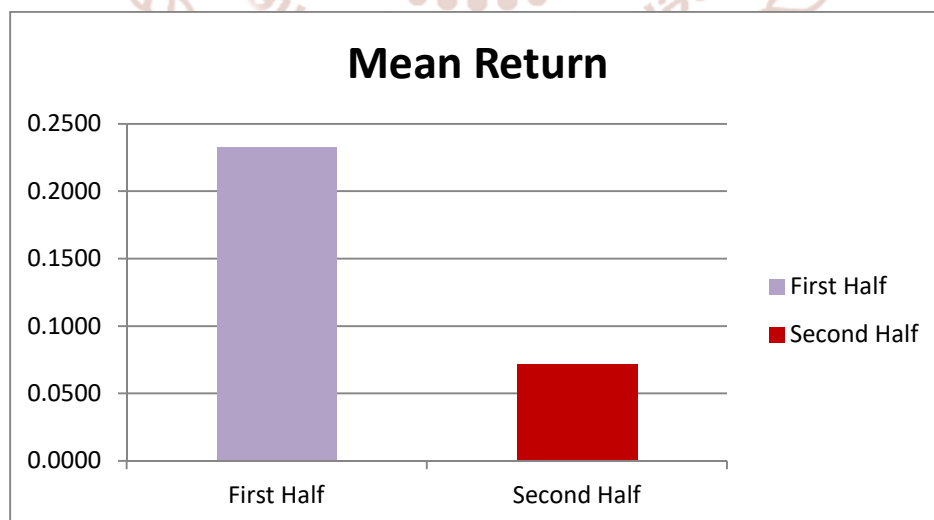
7.1 Analysis of Descriptive Statistics for S&P BSE Healthcare index

As shown in **Table 1.1** the results of Descriptive Statistics of the Turn of Month returns in S&P BSE Health Care index returns from April 2002 to March 2016. The above table describes that the mean return of the First Half Month was higher (0.284) than that of the Second Half month (0.088) returns. Hence it is suggested that investors may buy the shares during the Second Half Month Period, which is low because it will give better returns to the investors. And sell their holdings in the First Half month.

The risk of the First Half month returns higher than the Second Half month. The peak of the return distribution was Leptokurtic in both First and Second Half month returns. Highest value of 19.38 recorded in First Half month returns. The return distribution was Negatively Skewed, which is -1.96 in First Half month and positively skewed, which is 0.39 in Second Half Month returns.

Chart 1.1 demonstrated the average Returns of First Half and Half Month Returns for S&P BSE Health Care Index from April 2002 to March 2016. It is perceived that the highest mean return was recorded in the First Half Month and lowest mean return was recorded in the Second Half Month.

Chart 1.1 Average Daily Returns – ‘Turn of the Month Wise’ for S&P BSE Healthcare index returns from April 2002 to March 2016



Source: Computed from Table 1.1

7.2 Analysis of Linear Regression Model for BSE S&P Healthcare index

The Results of Linear Regression analysis of S&P BSE Health Care Index Returns for the period from April 2002 to March 2016 was given in **Table 1.2**. It is understood that the analysis of the study indicates that the coefficient of daily return in First Half month

was positive (0.3050) and Second Half of the Calendar Month (-0.3021) was negative. But both were significant from zero at the 1% level. The F-statistic value was very high (41.3) and significant at 1% level. It indicates that the overall fit of the model was good. It concluded that, the Turn of the Month Effect did exist in S&P BSE Health Care Index Returns during the study period.

Table 1.2: The Results of Linear Regression Model for S&P BSE Health Care Index Returns - Turn of the Month wise from April 2002 to March 2016

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SECOND	-0.3021	0.0470	-6.4268	0.0000**
C	0.3050	0.0410	7.4484	0.0000**
R-squared	0.0117	Akaike info criterion		3.1813
Adjusted R-squared	0.0114	Schwarz criterion		3.1848
F-statistic	41.3033	Hannan-Quinn criter.		3.1825
Prob(F-statistic)	0.0000	Durbin-Watson stat		1.8037

Source: Computed using E-views

**Significant at 1% level.

8. FINDINGS AND SUGGESTIONS

- From the findings, for the BSE Healthcare sectoral index the First Half Month returns was higher than that of the Second Half month returns.
- Hence it is suggested that investors may buy the shares during the Second Half Month Period, which is low because it will give better returns to the investors.
- And sell their holdings in the First Half month.
- The risk of the turn of the month return distribution was highly volatile in First Half Month and least volatile in rest of the days of the month for all the sample sectoral indices during the study period.
- It also observed that there was direct relationship between risk and return. That is high risk with high return and vice-versa.
- Hence, it suggested that that the policy makers may try to reduce the inverse risk return relationship.
- The Results of Linear Regression analysis found that there was significant difference between the returns of First half month and Second Half month returns.

- The analysis of the study further indicated that the coefficient of daily return in First Half month was positive and Second Half of the Calendar Month was negative.
- But both were significant from zero at the 1% level. The F-statistic value also high and significant at 1% level. It indicates that the overall fit of the model was good.
- So it confirm the Turn of the Month Effect exist in BSE Healthcare index returns during the study period.

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