

Testing the Significance of Turn-Of-The-Month Effect in Indian Stock Market

Dr Vandana Khanna¹, Rahul Singh²

^{1,2} (Department of Management Studies, MM University, Sadopur-Ambala)

Abstract: *Turn-of-the-Month effect states that stocks consistently exhibited higher returns on the last day and first four days of the month (Cadsby and Ratner 1992). It documents that stocks consistently exhibit higher returns on the last day and first four days of the month. Turn-of-the-month anomaly, is, thus a part of the broader anomaly, namely, Monthly effect. It was initially documented by Ariel (1987), states that it is the concentration of positive stock returns in the last trading day and the first five trading days of each month and suggested that one possible explanation is systematic purchasing by pension funds at the turns of months. Recently, it has been suggested that the explanation for the Turn-of-the-Month effects could be behavioral. Recent studies in human behavioral psychology indicate that the tendency to find patterns may be a natural framework for human beings when observing any phenomenon. The present study examines Sensex for the period through January 1, 2001 upto December 31, 2014 and it is found that Turn-of-the-Month is present in Indian stock market.*

Key words: *Efficient Market Hypothesis, Turn-of-the-Month effect, Seasonality.*

I. Introduction

The concept of stock market efficiency acts as a central paradigm in explaining the behaviour of share prices. A continuous equilibrium exists when a security price and its value vibrate randomly together in such a manner that they are continuously equal as the time passes. It is the speed of this price adjustment process that reveals exactly, how efficient a market is. The term 'efficiency' is used to depict the ability of the stock market to process information with respect to speed and quality. Such efficiency would produce price that is appropriate in terms of current knowledge.

A number of irregularities have not been explained by any of the traditional asset pricing models. These irregularities are known as 'Anomalies'. Anomalies are the empirical results that seem to be consistent with maintained theories of asset-pricing behavior. They indicate either market inefficiency (profit opportunities) or inadequacies in the capital asset pricing model (Schwert 2003). In recent years, the testing for market anomalies in stock return has become an active field of research in empirical finance and has been receiving attention from not only in academic journals but also in financial press. Different financial economists have investigated various aspects of stock market anomalies at number of times. The most common anomalies are the Day-of-the-Week Effect, Week-End Effect, January effect, Turn-of-the-Month effect and Holiday Effect.

According to Lakonishok and Smidt (1988), the trading days are partitioned into two sets to capture the effect. The first set consists of the first fifteen trading days and the other set contains the last fifteen trading days for each month and it is empirically proved that the average trading returns in the first half are greater than the trading returns in the second half. The average trading returns for stocks are positive for days immediately before and during the first half of the Calendar month (Ziemba and Hensel 1994; Dickinson and Peterson 1995) is known as Monthly effect whereas Turn-of-the-Month effect states that stocks consistently exhibit higher trading returns on the last day and first four days of the month (Odgen 1990; Cadsby and Ratner 1992).

This paper examines Monthly effect and Turn-of-the-Month effect in the Indian stock market. The evidence in literature shows that distribution of monthly trading returns is not identical across different trading days of the month as Monthly effect states that the mean returns for stocks are positive for days immediately before and during the first half of the calendar month (Ziemba and Hensel 1994). On the other hand, Turn- of-the-Month effect states that stocks consistently exhibited higher returns on the last day and first four days of the month (Cadsby and Ratner 1992).

Further discussion has been organized in four sections. Section II reviews the literature, Section III discusses data base and methodology, section IV analyses the data and finally in section V, conclusions have been drawn.

II. REVIEW OF LITERATURE

This section provides an overview of the studies, which have observed Turn-of-the-Month effect in international as well as national context. The empirical evidences from literature shows that the Turn-of-the-Month effect still exists in financial markets but no theoretical explanation has satisfied the researchers, in spite of number of efforts made by the academicians to explain the Turn-of-the-Month effect.

Table 1: EMPIRICAL EVIDENCES ON TURN-OF-THE-MONTH EFFECT

Sr. no.	Author	Data	Period of study	Findings
1.	Ariel (1987)	1. NYSE (US) 2. AMEX (US)	1963-1981	(+ve) return for first 15 days of the month.
2.	Ogden (1990)	CRSP	1969-1986	Expected liquid profits vary inversely with stringency of the monetary policy of the month.
3.	Ziembra and Hensel (1994)	S & P 500 (US)	1928-1993	Bulk of the monthly returns occurred at the turn of the month and all the monthly gains occurred in the first half of the months. The average returns in first half of the month were above average for turn-of-the month.
4.	Boudreaux (1995)	MSCI for Denmark, France, Germany, Norway, Singapore, Malaysia, Spain and Switzerland.	1978-1992	Three of the seven countries had the monthly effect.
5.	Dickinson and Peterson (1995)	S&P 500 Options (US)	1983-1990	TOM effect occurred in the first five trading days of the month.
6.	Aydogan and Booth (1999)	1. TL (Turkey) 2. USD (Turkey) 3. DM (Turkey)	1986-94	Returns were highest for first five trading days of the month.
7.	Kohers and Patel (1999)	1. S & P Composite Index (US) 2. NASDAQ (US)	1960-1995 1972-1995	Returns were highest during the first third of the month (day 28 through day 7) and lowest during the last third (day 18 through day 27) of the month.
8.	Pandey (2002)	BSE Sensitivity Index (India)	1991-2002	Maximum positive returns were found in February and lowest (negative) in March.
9.	Brusa et al., (2003)	1. NYSE Industrial index (US) 2. NYSE composite index (US) 3. DJIA index (US)	1966-1996	Monday returns were negative in January and were not different when week-of-the-month effect was examined.
10	Mangala and Mittal (2004)	S & P CNX Nifty	1994-2003	Mean returns for first half of the month and turn of the month were exhibiting the highest trend..
11.	Mittal (2004)	S & P CNX Nifty	1994-2003	Maximum volatility was observed on first and last trading day of the month.

Where, AMEX=American Stock Exchange, BSE= Bombay Stock Exchange, CRSP= Center for Research in Security Prices, DJIA= Dow Jones Industrial Average, DM=German Mark, MSCI= Morgan Stanley Capital International, NASDAQ= National Association of Security Dealers Automated Quotational, NYSE= New York Stock Exchange, S & P=Standard & Poor, S & P CNX Nifty= Standard & Poor Crisil National Stock Exchange Index of Fifty Stocks, TL=Turkish Lira, USD=US Dollar

Trading returns were found highest in the first five trading days of the month (Ziembra and Hensel 1994; Boudreaux 1995; Aydogan and Booth 1999 and Yakob et al., 2005). The returns were maximum in the first half of the month (Ariel 1987; Lakonishok and Smidt 1988 and Mangala and Mittal 2004), in contrast with Khaksari and Bubnys (1992), where the effect was found only for equity markets and not documented for futures market. There were a number of explanations to find the cause for the Turn-of-the-Month effect i.e. causes from the clusterization of salary payments, monetary policies and other liabilities, increased liability, from the clusterization of the earning announcement releases, presidential circles and house-hold liquidity, excess returns in January for large firms, dividend effect, economic and political announcements dates concentrated in one part of the month has been found till the date.

Ariel (1987) documented an empirical regularity in stock returns and termed it the “Monthly effect”. Using value-weighted and equally weighted daily stock index returns, the author documented that virtually all of the cumulative returns on these indexes were realized on ten consecutive trading days of the calendar month beginning with the last trading day of the month and extended through the first nine trading days of the following month. Lakonishok and Smidt (1988) found that significant mean daily

returns were realized consistently on only four consecutive trading days of the calendar month, beginning with the last trading day of the month. These trading days would henceforth be referred to as the turn-of-the-month trading day. Ariel's and Lakonishok and Smidt's tests indicated that the monthly effect is not merely the manifestation of the "January effect".

Although the anomalies have been widely investigated, academic research has not been yet able to reach consensus on the reasons for them. Moreover, the true impacts of the suggested explanations are difficult to measure.

III. DATA BASE AND METHODOLOGY

The daily stock price data of the Sensex has been taken for the period of January 1, 2001 upto March, 31, 2014. Daily closing share prices have been taken from the website www.yahoofinance.com, which contains the information of all the actively traded stock at any given time on both BSE as well as NSE.

Daily stock prices have been converted to daily returns. The present study employs the logarithmic difference for the first order as the logarithmic difference is symmetric between up and down movements and is expressed in percentage terms for ease of comparability with the idea of percentage change. While computing daily returns, multi-period returns have been excluded to avoid any bias on account of holiday effect. For instance, as Saturday and Sunday are non-trading days, the returns on Monday have been excluded. In the same way, if any other trading day is holiday, the returns on next day to that holiday have been excluded. If P_t is the closing of Sensex on date t and P_{t-1} be the same for the previous business day, then the one day return on the market portfolio is calculated as:

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

The objective of the present empirical study is to examine the Turn-of-the Month/Monthly Effect in Indian Stock Market. To test this, the following null hypothesis has been tested against the alternate hypothesis (Mangala and Mittal (2004)).

H_0 : Mean daily returns in the first half of the trading month (1 to 15) is equal to the mean daily returns in the second half of the trading month (16 to 30 or 31) against the alternate hypothesis;

H_1 : Mean daily returns in the first half of the trading month (1 to 15) is more than the mean daily returns in the second half of the trading month (16 to 30 or 31).

The first half and the second half of each month consist of 1, 2, ..., 14, 15 trading days and 16, 17, ..., 30, 31 trading days respectively. Here, 1 represents the first trading day of a month and 30 or 31 represents last trading day of the trading month.

IV. RESULTS AND ANALYSIS

Table 2 depicts the descriptive statistics calculated for the purpose of analysis for the period of 2001-2014.

Table 2: Descriptive statistics for aggregated and bifurcated time period:

2001-2014								
	N	Mean	Max	Min	Std Dev	Skew	Kurt	Jarqu-bera
FIRST HALF	1585	0.1014	19.227	-15.2757	2.4736	0.459	12.3105	4143.655*
SECOND HALF	1625	0.0707	15.104	-12.4104	2.4536	0.596	8.2363	984.982*
TOTAL	3210	0.0659	16.227	-15.2757	3.3851	0.38315	9.4215	4360.061*
2001-05								
FIRST HALF	405	0.1444	17.2270	-17.2757	3.3498	0.3929	11.8189	934.1517*
SECOND HALF	385	0.1902	16.1049	-11.4104	3.0447	0.5787	7.8077	283.2528*
TOTAL	790	0.2014	17.2270	-17.2757	3.2249	0.4683	10.2502	1255.921*
2005-10								
FIRST HALF	450	0.0210	9.8026	-6.5894	1.7056	0.7331	7.6832	225.0179*
SECOND HALF	450	-0.0612	9.5675	-8.6523	2.0228	0.8722	6.5018	267.6085*
TOTAL	900	-0.0175	10.812	-8.6423	1.890	0.814	6.5212	518.7723*
2010-14								
FIRST HALF	397	-0.0521	6.0417	-6.3461	1.9663	-0.2006	4.0119	11.3749*
SECOND HALF	342	0.0581	6.8669	-6.3703	2.6301	-0.0175	3.9025	14.4562*
TOTAL	739	0.0195	6.7769	-8.3702	2.1227	-0.1078	4.0144	32.1539*

□ Significant at 1% significance level.

The results have been calculated for aggregated and sub-period in Table 2. The average returns for first half of all the months should be greater than the average returns for second half of all the months of all the years taken together for analysis. During the aggregated period, Table 2 depict that for 2001-14, average trading returns for first half of all the years are greater than trading returns for second half of the year i.e. 0.1014 is greater than 0.0707. Standard deviation for second half is 2.4736 is greater than the returns for first half of the days i.e. 2.4536. Returns are positively skewed for both the bifurcated periods and Kurtosis is greater than three for both first and second half of the trading days of all the months undertaken. During the period of 2001-05, average trading returns for second half are greater than the returns for the first half of the period i.e. 0.1902 and 0.1444 respectively. Standard deviation is 3.3498 are higher for first half of the period than 3.0447 for second half of the period. Returns are positively skewed and Kurtosis is greater than three for both the bifurcated periods. Value of Jarque-bera is significant at 1% level of significance.

During 2005-10, mean trading returns are greater i.e. 0.0210 for first half of the period than second half of the period i.e. -0.0612, where standard deviation is higher for second half i.e. 2.028 than the returns for first half i.e. 1.7056. Returns are positively skewed and Kurtosis is greater than three for the period. During 2010-14, trading returns for second half of the period are greater i.e. 0.0521 than trading returns for first half of the period, where average trading returns are negative i.e. -0.0581. Standard deviation is positive and skewness is negative for both first and last fifteen days of all trading months. Kurtosis is greater than three for both the bifurcated days i.e. first and second halves and value of Jarque-bera is significant at 1% level of significance.

Thus, it is clear from Table 2 that trading returns for Sensex are not identical during the period as EMH assumes. However, the following explanations for the Turn-of-the-Month effect has also been advanced i.e. inventory adjustments of different traders, the timing of trades by informed and uninformed traders and specialists' strategies in response to informed traders, seasonal tax-induced trading (Lakonishok and Smidt 1986) and window dressing induced by periodic evaluation of portfolio managers.

As mentioned above and shown by In addition to regular payments of the private companies, employees are paid on 15th of each month in public sector and according to Ogden (1990), standardization in payment systems depending on the money policy of the Central Bank might be one of the factors that cause large returns at the Turn-of-the-Months. Whereas, Jacobs and Levy (1988) explained the effect due to psychology of investors to postpone their investment decisions until the starting of the periods. Abnormally high positive returns at the Turn-of-the-Month and during the first half of the month have been suggested to arise from the clusterization of salary payments and other liabilities. Although the anomalies have been widely investigated, academic research has not yet been able to reach consensus on the reasons for them. Moreover, the true impacts of the suggested explanations are difficult to measure.

V. CONCLUDING OBSERVATIONS

To conclude, it can be stated that the findings have revealed that the trading returns around the Turn-of-the-Month are significantly different from the total daily returns for the BSE-Sensex for aggregated and bifurcated period i.e. 2001-14. The present study provides several important implications for investors, academic researchers and bureaus which collect and disseminate essential statistical data on the economy. Even, investors can gain useful information about the abnormalities of the stock market during a Calendar month and may provide some opportunities for profitable trading strategies. Furthermore, the present study provides a new measure for the estimation of the expected risk premium and finally, the results may provide new insights for consideration of the timing of important macroeconomic news announcements (Shaheen 2002).

REFERENCES:

- [1] Ariel, R.A., A Monthly Effect in Stock Returns, *Journal of Financial Economics*, Vol. 18, 1987, pp. 161-174.
- [2] Aydogan, K. and Booth, G., Calendar Anomalies in the Turkish Foreign Exchange Markets, *Applied Financial Economics*, Vol. 13, 1999, pp. 353-360.
- [3] Boudreaux, D. O., The Monthly Effect in International Stock Markets: Evidence and Implications, *Journal of Financial and Strategic Decisions*, Vol. 8 (1), 1995, pp. 15-20.
- [4] Brusa, J., Liu, P. and Schulman, C., The Reverse Week End Effect: The U.S. Market Versus International Markets, *International Review of Financial Analysis*, Vol. 12(3), 2003, pp. 267-286.
- [5] Cadsby, C. B. and Ratner, M., Turn of the Month and Pre-Holiday Effects on Stock Returns: Some International Evidence, *Journal of Banking and Finance*, Vol. 16(3), 1992, pp. 497-509.

- [6] Dickinson, A. and Peterson, D. R., Expectation of weekend for turn of the month mean return shifts implicit in call option prices", 1995, <http://seasonaleffects.behavioral-finance.com>.
- [7] Jacobs, B. and Levy K., Calender Anomalies: Abnormal Returns at Calendar Turning Points, *Financial Analysis Journal*, Vol. 44 (6), 1988, pp. 28-39.
- [8] Khaksari, S. and Bubnys, E.L., Risk-Adjusted Day-of-the-week, Day-of-the-Month, and Month-of-the-year effects of stock indexes and stock index futures", *The Financial Review*, Vol. 27 (4), 1992, pp. 531-552.
- [9] Kohers, T. and Patel, J. B., A New Time-of-the-Month Anomaly in Stock Index Returns", *Applied Economics Letters*, Vol. 6, 1999, pp. 115-120.
- [10] Lakonishok J and Smidt, S., Volume for Winners and Losers: Taxation and other Motives for Stock Trading", *Journal of Finance*, Vol. 41, 1986, pp. 951-974.
- [11] Mangala, D. and Mittal, R. K., Efficiency of Indian Stock Market-An Evidence of Day of the Week Effect", *Gyan*, Vol. 1 (1), 2005, pp. 3-8.
- [12] Mittal, R.K., Stock Market Anomalies: The Day-of-the-Week Effect in Stock Returns", *Indian Journal of Finance and Research*, Vol. 4 (1), 1994, pp. 13-21.
- [13] Mittal, R.K., Weak Form Market Efficiency: Empirical Tests on the Indian Stock Market, *Prajnan*, Vol. 23, 1994, pp. 297-313.
- [14] Ogden, J.P., Turn of Month Evolution of Liquid profits and stock returns: A Common Explanation for the Monthly and January Effects", *Journal of Finance*, Vol. 45, 1990, pp. 1259-1272.
- [15] Pandey, I. M. (2002a), Is There Seasonality in the Sensex Monthly Returns, Working paper No: 2002-09-08, IIM Ahmedabad, pp. 1-17.
- [16] Pandey, I.M., Seasonality in the Malaysian Stock Market: 1992-2002, *Journal of Financial Management and Analysis*, Vol. 15, 2002 (b), pp. 37-44.
- [17] Schwrt, W. G., Anomalies and Market Efficiency, *Handbook of the Economics of Finance*, Edited by G.M. Constantinides, Chapter 15, 2003, pp. 939-974.
- [18] Shaheen, R., Stock Returns and the Day of the Week Effects: Karachi Stock Exchange, retrieved from <http://www.campus-for-finance.com> as on January 23rd, 2009.
- [19] Yakob, N. et al., Seasonality in the Asia Pacific Stock Markets", *Journal of Asset Management*, Vol. 6 (4), 2005, pp. 298-318.
- [20] Ziemba, W.T. and Hensel, C.R., Worldwide Stock Market Anomalies, *Physical Sciences and Engineering*, Vol. 347, No. 1684, *Mathematical Models in Finance*, 1994, pp. 495-509.