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15 June 2009

Online at <https://mpra.ub.uni-muenchen.de/21290/>
MPRA Paper No. 21290, posted 13 Mar 2010 10:36 UTC

STOCK MARKET ANOMALIES: A SURVEY OF CALENDAR EFFECT IN BSE-SENSEX

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Whether inexplicable patterns of abnormal stock market returns are detected in empirical studies of the stock market, a return anomaly is said to be found. There are other similar anomalies existing in the stock market. Economically meaningful stock market anomalies not only are statistically significant but also offer meaningful risk adjusted economic rewards to investors. Statistically significant stock market anomalies have yet-unknown economic and/or psychological explanations. A joint test problem exists because anomalies evidence that is inconsistent with a perfectly efficient market could be an indication of either market inefficiency or a simple failure of Capital Asset Pricing Model (CAPM) accuracy. Some of the most-discussed about market anomalies are return anomaly, market capitalization effect, value effect, calendar effect, and announcement effect. Though various studies have been conducted to find out the presence of these anomalies across the stock markets worldwide, very few studies with reference to Indian stock market are available in the financial literature. This study aims to find the evidence of one of the anomalies, calendar effect in BSE Sensex, India's leading stock exchange.

Calendar effect connotes the changes in security prices in stock market following certain trends based on seasonal effects. Such trends or consistent patterns occur at a regular interval or at a specific time in a calendar year. Presence of such anomalies in any stock market is the biggest threat to the concept of market efficiency as these anomalies may enable stock market participants beat the market by observing these patterns. This notion again violates the basic assumption of efficient market hypothesis (EMH) that no one can beat the market and earn the profit in excess of market.

Anomalies are the result in the shortfalls in the models applied for testing market efficiency, rather than of inefficiency of market (Bowman and Buchanan, 1995). There could be a number of calendar anomalies that exist in the stock. A January effect has been documented in several

studies that show unusually large positive rate of returns for stocks during the first few trading days of the year (Cooper et al., 2006). Unusually good performance for the stocks on the day prior to market closing holidays have also been documented; this phenomena be known as Holiday effect. Monday is the only day of the week that averages a negative rate of return. This Monday effect has given rise to the refrain, “Do not sell stocks on *blue* Monday”. Change in month itself acts as a psychological stimulator and boosts up the purchase behaviour in stock market. This implies that average daily returns of stock on turn of the month are different from the average daily returns in rest of the month. Ariel (1987) was the first to identify this anomaly in US stock prices at the beginning of one month and end of the other month. He studied this effect by considering last day of one month and the first three days of upcoming month. Changes in stock prices in these days are found positive. However different studies have given different conclusions for this effect which could be opposite to these results as well.

Daily stock returns are also different from each other at different points of time during a month. This study tried to test this difference by dividing a month into segments and then analyzing the returns for these segments separately in order to find out that in which segment daily stock returns are highest.

Different researchers have used different event windows to study Turn of the Month Effect. Ariel (1987) while evaluating turn of the month effect, defined his event window as (-1, +4) *i.e.* last working day of previous month and first four days of upcoming month. Lakonishok and Smidt (1988) analyzed Dow Jones Industrial Average (DJIA) for turn of the month effect with an event window of (-1, +3) *i.e.* last working day of previous month and first three days of new month. Evidence of turn of the month effect for USA, Canada, Switzerland, Germany, UK and Australia has also been found, however no such effect has been reported fro Japan, Hong Kong, Italy, and France (Cadsby and Ratner, 1992). Existence of turn of month effect has also been proved for stock markets of eighteen countries in 1970s (Agarwal and Tondon, 1994).

As far as the Time of Month Effect is concerned, very first evidence about this effect is found back in 1999 when Kohers and Patel tested this effect in USA using S&P index for period 1960-1995 and NASDAQ index for period 1972-1995 by dividing whole month into three parts. Their

results revealed stock returns were highest in first segment, second segment showed a decreasing trend and in third and last segment returns were either too low or negative in most cases. Cadsby and Torbey (2003) questioned the robustness of Kohers and Patel's (1999) time of month effect and argued whether it is a reality or just a mirage or illusion? Their study focused on two things. One whether time of month effect is present in other than US markets as well, and second whether it is independent of turn of month effect or just an extension of it? Significant results for Time of Month effect were found for Canada, France, Switzerland, Germany, UK, Hong Kong and Italy. For three out of nine countries, other than USA, time of month effect partially presents when turn of month days are removed. But two other countries provided evidence in opposite direction as well.

This study has been conducted to find out whether **Turn of the Month Effect** and **Time of the Month Effect** in BSE-SENSEX. Data pertaining to daily stock index of SENSEX, the capital weighted index of Bombay Stock Exchange (BSE) for the period April 1998 to March 2008 has been used in this study.

In order to test the calendar effect, daily logarithmic market returns are calculated for the specified period of ten years using the following formula:

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

Where:

R_t = Continuously compounded rate of change

Ln = Natural Log

P_t = BSE 30 index at time t

P_{t-1} = BSE 30 index at time t-1.

For Turn of the Month effect, a five-day window has been used as suggested by Hansel and Ziemba (1996) and following regression equation has been run to find out the Turn of Month effect:

$$R_t = \beta_0 + \beta_1 d_{2t} + \varepsilon_t$$

Significant positive value of coefficient β_1 will prove the Turn of the Month effect.

For Time of the Month Effect, this study followed the model given by Bahadur and Joshi (2005). Following regression equation with dummy variables is used to find out the Time of the Month effect:

$$\mathbf{R}_t = \beta_0 + \beta_1 \mathbf{d}_{2t} + \beta_2 \mathbf{d}_{3t} + \varepsilon_t$$

One significant positive value of any of the coefficients β_1 and β_2 can prove the Time of the Month effect in Bombay Stock Exchange (BSE 30 SENSEX).

This study has been conducted to test the market efficiency in Indian stock market by examining calendar effect present in Bombay Stock Exchange, the largest stock exchange in India. In order to test the evidence of calendar anomalies, BSE's leading index BSE 30 SENSEX has been selected as a sample for this study.

Results from this study reveal that a very anomalous behaviour towards returns has been found in BSE 30. For both the effects, the Turn of the Month effect as well as the Time of the Month effect, significant values were found. Both the effects are found to be almost same. Returns during a month are analyzed by dividing that month into three parts separately. And it was found that early days of the month witness higher mean returns than later days of the same month. The reason behind this trend could be the cognitive belief of investors with regard to new and positive changes in policies and newer information in the coming month. This results in selling pressure by investors with the hope to get positive benefits, leading to low returns at the end of month. With the beginning of new month, investors start buying into stocks following the same cognitive belief and incorporating new information.

Existence of these anomalies in Bombay Stock Exchange is against the principle of market efficiency as it may offer abnormal economic rewards to the investors tracking these anomalies. Those at helm should chalk out policies to check this anomalous behaviour of the stock market so that the market could become really efficient.

Key References:

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