A STUDY OF THE DAY OF THE MONTH EFFECT IN THE INDIAN STOCK MARKET

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Abstract

Seasonality and seasonal variations are common phenomena associated with the stock markets and the Indian stock market is no exception to them. An interesting anomaly in seasonality is the day-of-the-week effect, which this paper tries to unravel. Many researchers have investigated the effects of seasonal fluctuations such as month-of-the-year, day-of-the-month, and day-of-the-week. Historical evidence suggests that these anomalies are prevalent in the market and if properly studied investors can take advantage of the market and try to beat the Efficient Market Hypothesis (EMH). This paper attempts to understand the day-of-the-week effect in the Indian stock market.

Keywords: *Seasonality, Seasonal Variations, Month-of-the-Year Effect, Day-of-the-Month Effect, and Day-of-the-Week Effect*

INTRODUCTION

The reign of the Indian capital market is two centuries old dating back to the 18th century when India was still under the rule of the British East India Company. The upliftment of the capital market in India was centred around Mumbai. The current financial market in India is much more mature and advanced than many other sectors it was organized long back by the securities exchanges of Mumbai, Ahmedabad, and Kolkata as early as the 19th century. "In time series data, the fluctuations or variations that are present at certain intervals within the year, that may be quarterly, monthly, or weekly is known as seasonality". Seasonality can be caused by any other factors such as; vacations, festivals, holidays, weather and other persistent patterns of the time series. These time series patterns if examined correctly can be predicted and taken advantage of by investors. The Efficient Market Hypothesis (EMH) states that no investor can continuously beat the market and the flow of information is constant and everyone has all the information of the market. Thus the EMH states that no investor can outperform the market continuously. Although the seasonality anomalies contradict the Efficient Market Hypothesis (EMH) as it is a way to continuously beat the market.

Seasonality was first found and reported by Hess P, Gibbons MR,(1981)[1]. Hess P, Gibbons MR,(1981)[2] found that yields of the U.S stock market were significantly lower on Monday and were higher on Friday. Ariel (1987)[3] stated that average returns only around the beginning and during the first half of calendar months and show zero returns during the second half. There are several other studies as well that have discovered such market anomalies. In the continuum of Ariel's study Jaffe, J., & Westerfield, R. (1989)[4] found that the evidence of what Ariel had found was accurate but furthermore they discovered the last day of the month effect and that the last trading day

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of the month usually had a negative return. Jaffe, J. F., Westerfield, R., & Ma, C. (1989)[5] found a link between the Monday effect and the Friday effect and concluded that they were correlated and stated that the Monday effect disappears if the previous Friday market had risen. Barone, E. (1990)[6] analyzed the Italian stock exchange and concluded that although seasonal variations occur but they are not consistent over time they differ.

Stock markets around the world although different from one another govern under the same principles of the capital market and have the same attributes and characteristics. Thus, the Indian stock market is no exception to such anomalous variations, and if regularly monitored these anomalies can be a boon for investors and traders.

SEASONALITY

The ripples generated by politics and macroeconomic announcements may sometimes be difficult to understand broader patterns in the stock market. These patterns may replicate on a seasonal basis, or occur more at irregular intervals. Seasonal patterns are anchored in yearly taxation milestones, pension and bonus payments, the quarterly "earnings season", "window-dressing" on the part of fund managers, index-rebalancing periods, possible seasonal psychological effects, production, advertising, and release cycles in the industry, and a likely myriad of other factors that are more intricate to identify and pinpoint. One should not expect seasonal patterns to be set in stone as tax rates and schedules change, and so should the associated seasonal effects. Despite something of a contradiction of the "efficient market hypothesis" these patterns do tend to persist and can be taken advantage of. most of the seasonal investment tests have outperformed the general market very significantly on scales as small as a day to as long as 3 months. The philosophy that underlies the seasonal investing strategy is that the more losses can be eliminated or reduced, the greater is the reduction of risk and therefore the better the chance for greater profits.

For this research purpose, the word "seasonality" is defined as a number of seasonal trends that seem to exist in the stock market. A seasonal trend is a recurrent time period when the stock market has a statistically high tendency to either rise or fall. Seasonal investing relies on probabilities, and uncertainties, and therefore is subject to periods where it underperforms more conventional investment methods. In addition, the investment discipline that emerges from a study of seasonality tends to be very quantitative, taking little notice of the usual indicators of market health, such as earnings growth, recessions, war, and the day-to-day news that surrounds the stock market. Although, there is strong evidence from the previous studies that following certain seasonal trends have generated impressive results over the long term and there is strong seasonality in the stock market return distributions in most of the capital markets around the world. The seasonality, when it exists, appears to be caused by the disproportionately large January returns in most countries and April returns in the U.K. With the exception of Australia, these months also coincide with the turn of the tax year.

LITERATURE REVIEW

Wachtel, S. B. (1942)[7] were among the first to observe the seasonality in the stock markets. Cross, F. (1973)[8] examined the stock prices of the New York capital market and concluded that the movements of the stock prices on Friday and Monday are non-random. Rozeff, M. S., & Kinney Jr, W. R. (1976)[9] found that the month of January had consistently shown higher returns as compared to the rest of the year during a fifty-year assessment period. Furthermore, they also found evidence of seasonality in monthly returns or in other words evidence of the month of the year effect. Gibbons, M. R., & Hess, P. (1981)[10] studied the day of the week effect and found that there is a Monday effect prevalent in the stock markets and that the returns on Monday are significantly negative as compared to the rest of the days of the week. Gultekin, M. N., & Gultekin, N. B. (1983)[11] coinciding with the study of Rozeff, M. S., & Kinney Jr, W. R. they also found international evidence that strong seasonality exists in multiple international capital markets. January returns in the majority of countries except for April in the U.K had shown significantly higher returns. Givoly, D., & Ovadia, A. (1983)[12] in correlation with the previous studies and literature. They also found concluding evidence of the January effect and they also discovered that higher returns were also shown at the end of the fiscal year because shareholders were very active during the end of the

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fiscal period to gain the benefits over tax. Reinganum, M. R. (1983)[13] witnessed abnormally high returns during the initial days of January and the evidence is consistent with the previous literature and coincides with the phenomena of tax-loss selling. Smirlock, M., & Starks, L. (1986)[14] studied the day of the week effect of the Dow Jones Industrial Average over the period of 1963-1983. It was observed that Monday returns are negative while the returns from Friday close to Monday return are positive. Cadsby, C. B., & Ratner, M. (1992)[15] found that the turn-of-the-month effect was prevalent in countries like Germany, Australia, U.K, Switzerland and Canada. They also found that the Pre-holiday effect is significant in countries like Hong Kong, Japan, Australia and Canada. Raj, M., & Thurston, D. (1994)[16] findings contradict Reinganum, M. R. (1983) that there was no evidence of the January or April effect in the New Zealand stock market. Mills, T. C., & Andrew Coutts, J. (1995)[17] investigated the calendar anomalies in the FT – SE 100, Mid 250 and 350 indices they found evidence that supports much of the previous works of literature about the existence of January', 'weekend', 'half of the month' and 'holiday' effects. Abraham, A., & Ikenberry, D. L. (1994)[18] found compelling evidence of the weekend effect and found that there is a correlation in the returns of Friday and Monday. There is significant evidence stating that if the return on Friday is negative 80 per cent of the time the Monday return will also be negative. Maberly, E. D. (1995)[19] studied the ancient literature and found compelling evidence of the Monday Effect. Poshakwale, S. (1996)[20] found that the existing stock markets have seasonal anomalies such as the day of the week effect but on the contrary, the emerging stock markets do not have them. They had taken the Bombay Stock Exchange in assessment throughout 1987-1994. Brooks, C., & Persand, G. (2001)[21] studied the day of the week effect of multiple countries of the Asian stock markets and found that seasonality exists in three of the five markets under study. Fountas, S., & Segredakis, K. N. (2002)[22] studied seasonality and the January effect of 18 different stock markets, they found that seasonality does exist in several countries but less evidence was found about the hypothesis of the January effect and tax loss selling. Ajayi, R. A., Mehdian, S., & Perry, M. J. (2004)[23] studied the anomalies of the Eastern European Emerging Markets (EEEM) and found that their study was inline with the previous literatures that the Monday effect is present.Seyyed, F. J., Abraham, A., & Al-Hajji, M. (2005)[24] found compelling evidence of seasonality and volatility in the Pakistani stock market because of the influence of the Ramadan Effect. They observed that there was a significant decline in trading during the period of Ramadan, because of which the volatility of the market reduces. Raj, M., & Kumari, D. (2006)[25] investigated the presence of seasonal effects in the Indian stock markets. They found that the negative Monday effect and the positive January effect are non-existent in India instead Monday returns are positive while Tuesday returns are negative. Desai, D., Joshi, N. A., Chokshi, A., Dave, D., & Ramchandra, A. (2011)[26], found the presence of day-of-the–month effect in Indian stock indices and stocks. They found the last week of a month and the first week of the month to have a significant positive bias. Desai, D., & Trivedi, A. (2012)[27] found that there exists the day of the month anomaly and that the day-wise returns of S&P CNX NIFTY 50 were statistically different and there exists an opportunity to earn excess returns because of the anomaly. Prajapati, B. A., Modi, A., & Desai, J. (2013)[28]

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examined the day-of-the-month effect of eleven stock markets and found that day of the month effect is found in all of the stock markets around the world, which proves that some days in a month historically give superior returns. Vachhrajani, H., Desai, D., & Desai, K. J. (2014)[29] found that seasonality exists in the Indian stock market and that monsoon has a considerable amount of effect on the Indian stock market. Post-monsoon returns are almost double pre-monsoon returns.

OBJECTIVES OF THE STUDY
1. To study the seasonal anomalies of day of the month effect in the Indian Stock Market.
2. To understand the anomalies if existent and conclude on how can the investors benefit from such anomalies.

SAMPLE DATA AND SAMPLING FRAME
The daily return data of Bank NIFTY and NIFTY 50 are taken for the period of 1st January 2000 to 25th October 2022. The data was taken from www.nseindia.com the official website of the National Stock Exchange of India.

HYPOTHESIS
The hypothesis is that the mean daily return of Nifty 50 and Bank NIFTY is the same for all the days of the month

H_0: Mean daily return of Nifty 50 and Bank NIFTY for all the days of a month is same.
H_1: Mean daily return of Nifty 50 and Bank NIFTY for all the days of a month is not the same.

The hypothesis is tested for the test data in the study.

RESEARCH METHODOLOGY
For the calculation of the percentage return the below method is used.

$$R_{i_t} = \frac{C_{i_t} - C_{i_{t-1}}}{C_{i_{t-1}}} \times 100$$

Here,
- R_{i_t} = The percentage return of period t.
- C_{i_t} = The closing value in period t.
- $C_{i_{t-1}}$ = The closing value of the preceding period t-1.

For the calculation of the average return the below mentioned method and formula is used.

$$A_i = \frac{\sum C_i}{n_i}$$

Here,
- A_i = Average return
- $\sum C_i$ = Sum of all closing values
- n_i = Number of closing values or number of sample

To test whether the Nifty returns are stationary or not, we have used ADF Test which is considered formal test of stationarity. ADF test involves estimating regression equation and carrying out the hypothesis test.
$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \delta_2 \Delta y_{t-2} + \ldots$

To test the differences between the returns of the dates dummy variable regression model will be used.

$$Y_i = f(X_i, \beta) + e_i$$

Here,
- Y_i = Dependent Variable
- f = Function
- X_i = Independent Variable
- β = Unkown Parameters
- e_i = Error Term

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FINDINGS

Table I				
Date	Coefficients	Standard Error	t Stat	P-value (95%)
1st Date	0.48559004	0.145210254	3.344047878	**0.000831025**
2nd Date	0.324998292	0.148441203	2.189407553	**0.028607952**
3rd Date	0.0452854	0.139380439	0.32490499	0.745264996
4th Date	0.106350397	0.138704217	0.766742351	0.443266719
5th Date	-0.005262682	0.139722635	-0.037665207	0.969955946
6th Date	-0.041128603	0.14183534	-0.289974299	0.771846529
7th Date	-0.03577281	0.138370121	-0.258529873	0.796007404
8th Date	-0.099935588	0.139380439	-0.716998666	0.473404527
9th Date	**0.27437161**	**0.14041538**	**1.9539997**	**0.050750469**
10th Date	-0.047433499	0.141119512	-0.336122897	0.736790661
11th Date	-0.139497159	0.138704217	-1.005716782	0.314594851
12th Date	-0.233022859	0.140067603	-1.663645655	0.096238662
13th Date	0.116903857	0.141119512	0.828403218	0.407477139
14th Date	0.121024032	0.14367823	0.842326863	0.399640634
15th Date	-0.004579588	0.147202366	-0.031110833	0.975182248
16th Date	0.101670948	0.139722635	0.727662686	0.466850217
17th Date	-0.173161039	0.139738456	-1.239179558	0.215330418
18th Date	-0.007741214	0.139048968	-0.055672576	0.955604613
19th Date	-0.116989626	0.140439199	-0.83302687	0.404864743
20th Date	-0.221163478	0.139392324	-1.586625949	0.112653277
21st Date	-0.161619983	0.140087402	-1.153708189	0.248668566
22nd Date	**-0.305653466**	**0.138708351**	**-2.203569307**	**0.027594797**
23rd Date	-0.209022214	0.138708351	-1.506918738	0.131887325
24th Date	-0.175458864	0.140439199	-1.249358193	0.211585783
25th Date	0.224734897	0.144897905	1.550987901	0.120960523
26th Date	0.123126697	0.144897905	0.849747943	0.395501197
27th Date	-0.02465173	0.139048968	-0.177288121	0.859288428
28th Date	0.179574195	0.138370439	1.297778596	0.19441634
29th Date	-0.011185922	0.144508675	-0.077406576	0.938302847
30th Date	-0.001390366	0.145686654	-0.009543537	0.992385811
31st Date	0.171853725	0.182468212	0.941828296	0.346320773

The return of the 1st day of the month is significantly different as compared to the rest of the days of the month as the p-value is the lowest at 0.000831025, this finding is consistent with the literature. The 22nd day of the month has a p-value of 0.027594797 which has the seond most significant difference in returns as compared to the other dates. The 2nd day of the month also has a significant difference as compared to the other days as it has a p-value of 0.028607952. Even the 9th day of the month has shown different returns as it has a p value of 0.050750469. The rest of the days of the month have shown consistently same returns.

CONCLUSION

Investors seeking returns should target the 1st day, 2nd day, 9th day and 22nd day of the month as they have shown abnormal returns in comparison to the other days of the month. The ending days of the month have shown significant deiffrrence in the literature but they are not consistent with my findngs. The reason can be that the market behaviour has changed or or my research is more consistent as I have taken more data as compared to some of the literartures.

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