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The Study on Calendar Anomalies in The Indian Stock Market

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ABSTRACT: Stock market anomalies can be broadly categorized as calendar, fundamental and technical anomalies. Calendar anomalies however are among the most discussed issues in the financial literature. This is because these anomalies are the primary contributors to the abnormalities in the stock returns. Calendar anomalies are defined as an irregular pattern of stock returns that are based on a calendar year. This paper attempts to determine the existence of calendar anomalies, namely, the Day of the week effect, Turn of the month effect, and Month of the year effect in the Indian stock market. Daily data of Sensex and Nifty from 1993 through 2013 are analysed using different statistical techniques. The tests indicate an absence of a significant day of the week effect and month of the year effect, while a significant turn of the month effect is observed. There are multiple hypotheses associated with anomalies, but only the turn of the month stands valid for the Indian context.

Keywords: *Calendar anomalies, Day of the week effect, Turn of the month effect, Month of the year effect.*

INTRODUCTION

The basic objective of investors is to maximize the return on the investment at the same time minimizing the risk for the investors. In a globalized economy, there are wide areas are availed for investments, viz., Bank Deposits, Mutual Fund, Real estate, Share Market, and so on. Investments may be short-term or long-term deposits. Short-term investments like Bank Deposits, Postal savings are having low risk. On the other hand, long-term investments like stocks, bonds, and real estate involve high risk but high return. Among these investments stock market or share market is a prominent investment today. Hence, the investors are rushing to invest in the share market to maximize their return on the investments. However, any investments are not free from risk. Likewise, share market investments also have a risk as well as return. The Efficient Market Hypothesis states that at any given time, security prices fully reflect all available information. When the market is said to be efficient the security prices fully reflect all information, then buying and selling of securities by the investors is purely a game of chance rather than any trading strategy, as a result, investors can't earn any exorbitant returns but can only earn a normal return, sometimes even may get a loss also. Therefore, to earn an abnormal return, the investors have to frame the trading strategies that are called seasonal anomalies viz, day of the week effect, the month of the year effect, monthly effect, holiday effect, the quarter of the year effect, and so on.

REVIEW OF LITERATURE

Kaushik (2017) scrutinized for presence of day-of-the week effect on returns of BSE Smallcap, Midcap and Largecap indices of Indian capital market using GARCH model and confirmed the presence of Day of the Week effect only in BSE Small cap.

Kumar (2017) investigated for the presence of January Effect, Day of the Week Effect and Turn of the Month Effect and concluded by stating that such anomalies will eventually disappear from the market with progress in information technology and systematized currency markets operational round the clock, ultimately reducing the cost of information.

Caporale & Zakirova (2017) reported that all anomalies disappear if transaction costs are taken into account thus, suggesting that no investor can make abnormal profits by any means.

Vachhrajani et al. (2014) and **Desai & Joshi (2018)** examined the presence of Monsoon Effect in the stock markets of India. Although they validate the existence of Monsoon Effect, i.e., the post-monsoon period returns were significantly higher than that of the pre-monsoon period, the regression model used by them was not appropriate as they did not introduce constant variable in the mean equation of the regression model, resulting in inadequate results.

STATEMENT OF THE PROBLEM

The Efficient Market Hypothesis (EMH) primarily says that markets efficiently process and exhibit the impact of all available information, hence, no investor can make abnormal returns. However, as seen through the review of existing literature, various anomalies like Month of the Year Effect, Day of the Week Effect, Holiday Effect, etc. have been found in the Indian stock market. The presence of such an anomaly enables investors to strategize and make abnormal profits. Therefore, examining the existence of anomalies would help investors make strategies for investment in securities. The focal point of this study is to analyse the existence of the Monsoon Effect in the Indian stock market and examine whether these anomalies can be used to build trading strategies to earn abnormal profits.

In recent years, there has been greater distress among shareholders, portfolio managers, and researchers concerning the behaviour of stock market prices. Investors are eager to earn a higher rate of return on their investments. Hence, to satisfy investors' expectations, the portfolio managers have to look at the stock market conditions keenly and accordingly advise investors and construct a sound portfolio. Our country is believed to be one of the fastest up-and-coming markets in the world with a well-established stock market with a long history of organized trading in securities.

OBJECTIVES OF THE STUDY

1. To study the month of the year effect in Indian Stock Market.
2. To examine the day of the week effect in Indian Stock Market.

METHODOLOGY OF THE STUDY

a. Sample selection

In India, the two leading recognized stock exchanges viz., the BSE Ltd and NSE play a crucial role in the growth of the Indian economy. Hence, these two stock exchange indices are considered for further studies. The researcher has selected 2 indices BSE Sensex and NSE Nifty based on the availability of data moreover, these indices are actively trading in the Indian Stock Market.

b. Data collection

An empirical study is mainly based on secondary data and the data collected for this study are daily, monthly of selected broad market and sectoral indices.

HYPOTHESES OF THE STUDY

1. Month of the year effect in NSE Nifty Month & BSE Sensex

Ho: There is no significant difference between NSE Nifty & BSE Sensex Monthly return of Mar - July and Other 7 Months

HI: There is a significant difference between NSE Nifty & BSE Sensex Monthly returns of Mar – July and Other 7 Months

2. Day of the week effect in BSE Sensex & NSE Nifty.

Ho: There is No significant difference between BSE Sensex & NSE Nifty Monthly returns on Monday, Wednesday, Friday, and the other 2 days

HI: There is a significant difference between BSE Sensex & NSE Nifty Monthly returns on Monday, Wednesday, Friday, and the other 2 days

LIMITATIONS OF THE STUDY

1. Every study is not free from limitations. Similarly, the present empirical study also has the following limitations.
2. The study covered only 2 market indices and do not consider all the indices due to a lack of availability of data.
3. The outcome of the study is based on data availed on BSE and NSE official websites.
4. The study is not involved in the comparison of BSE and NSE Indices.
5. Only two calendar anomalies are considered for the study, there are so many other calendar anomalies are present in the capital market but not taken for the study.

ANALYSIS OF DATA

Table 4.1: Average daily return of NSE Nifty during January 2011 to December 2021

Average Daily Monthly Return-NSE Nifty January 2011 to December 2021						
Year	Monday	Tuesday	Wednesday	Thursday	Friday	Grand Total
2011	0.1816%	0.0166%	0.2951%	0.0194%	0.5385%	0.2104%
2012	0.5097%	-0.1965%	0.0687%	0.1066%	-0.0883%	0.0829%
2013	-0.1253%	-0.0551%	0.2009%	-0.3849%	-0.2227%	-0.1163%
2014	-0.2290%	0.5212%	0.0636%	-0.0149%	0.1783%	0.1010%
2015	0.0277%	-0.1407%	-0.0373%	0.2043%	0.0785%	0.0265%
2016	0.2889%	-0.0043%	0.1067%	-0.0020%	0.1703%	0.1133%
2017	-0.0836%	-0.2095%	0.0343%	0.1098%	0.0791%	-0.0170%
2018	0.0109%	0.0648%	0.0336%	-0.1122%	0.0668%	0.0122%
2019	0.2055%	0.0336%	0.1130%	0.1217%	0.0369%	0.1016%
2020	0.0875%	-0.0174%	-0.0005%	-0.0319%	0.0191%	0.0127%
2021	0.0746%	0.0029%	0.0440%	-0.0396%	0.1547%	0.0471%
Total:	0.0862%	-0.0025%	0.0846%	0.0014%	0.0901%	0.0518%

From the above table it is clear that Indian stock market indices selected for the study shows significant variations in the average daily returns during the alternate 3 days of the week Monday, Wednesday and Friday. In NSE Nifty, during the period of study i.e., from January 2011 to December 2021, this 3 day's average monthly return is more than the average annual return (0.0520%). Thursday daily return is also showing a positive figure, but is less than the average return. So, it is clear that investors earn more returns during Monday, Wednesday and Friday.

Figure 4.1: Average daily return of NSE Nifty during January 2011 to December 2021

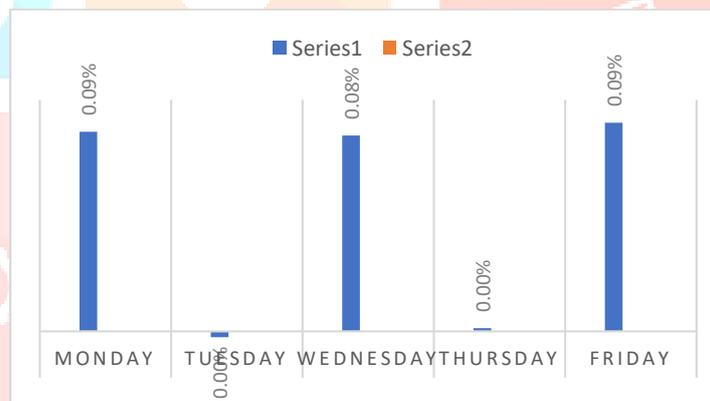


Table 4.2: Average daily return of BSE Sensex

January 2011 to December 2021

Average Monthly Return-BSE Sensex January 2011 to December 2021						
Year	Monday	Tuesday	Wednesday	Thursday	Friday	Total
2011	0.1152%	0.0510%	0.2213%	-0.0253%	0.5089%	0.1743%
2012	0.4910%	-0.1959%	0.0947%	0.0677%	-0.0961%	0.0748%
2013	-0.1424%	-0.1485%	0.0985%	-0.3226%	-0.3377%	-0.1716%
2014	-0.2506%	0.3944%	0.0554%	0.0048%	0.1119%	0.0595%
2015	-0.0251%	-0.1220%	-0.0355%	0.0759%	-0.0031%	-0.0223%
2016	0.2463%	-0.0007%	0.0201%	0.0065%	0.0711%	0.0683%
2017	-0.1095%	-0.1873%	-0.0409%	0.0044%	0.0064%	-0.0673%
2018	-0.0439%	-0.0030%	0.0674%	-0.1857%	-0.0154%	-0.0363%
2019	0.1396%	-0.0061%	0.0679%	0.0764%	-0.0181%	0.0517%
2020	0.0635%	-0.0535%	-0.0480%	-0.0669%	-0.0443%	-0.0279%
2021	0.0033%	-0.0522%	0.0057%	-0.1275%	0.0889%	-0.0169%
Total:	0.0433%	-0.0321%	0.0463%	-0.0431%	0.0224%	0.0073%

From the above table, it is clear that the Indian stock market indices selected for the study show significant variations in the average daily returns during the alternate 3 days of the week Monday, Wednesday, and Friday. In NSE Nifty, during the period of study i.e., from January 2011 to December 2021, this 3-day average monthly return is more than the average annual return (0.0520%). Thursday's daily return is also showing a positive figure but is less than the average return. So, it is clear that investors earn more returns on Monday, Wednesday, and Friday.

Figure 4.2: Average daily return of BSE Sensex

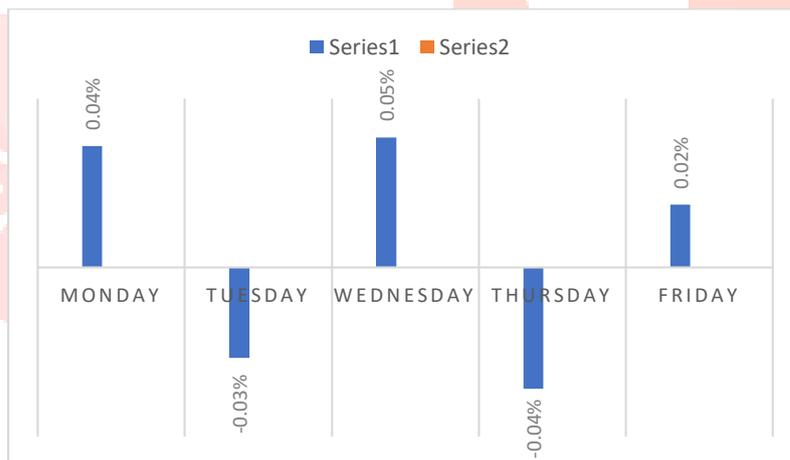


Table 4.3 ANOVA TABLE: Monthly average return of NSE Nifty

March- July and Other 7 Months NSE Nifty						
ANOVA: single factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Mar to July	5	0.101175	0.020235	0.000113388		
other 7 Months	7	0.005014	0.000716	0.00018274		
ANOVA						
<i>Source of variation</i>	<i>SS</i>	<i>Df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
between groups	0.001111	1	0.001111	7.1690806	0.023191	4.9646
within groups	0.00155	10	0.000155			
total	0.002661	11				

Hypothesis

Ho: There is no significant difference between NSE Nifty Monthly return of Mar - July and Other 7 Months

HI: There is significant difference between NSE Nifty Monthly return of Mar – July and Other 7 Months

The One-way ANOVA test identifies specific significant comparisons. As the p-value is less than 0.05 we reject the null hypothesis and it is clear that there is a significant difference between the NSE Nifty Monthly return of Mar - July and the Other 7 Months. From which investors can earn more returns during the month's Mar July compared with the other 7 months. The results of these tests confirm that in the NSE Nifty there is a significant month-of-the-year effect.

Table 4.4: ANOVA TABLE: Monthly average return of BSE Sensex

March- July and Other 7 Months BSE Sensex						
ANOVA: single factor						
SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
Mar to July	5	0.117603	0.023521	9.41736		
other 7 Months	7	0.014494	0.002071	0.000188058		
ANOVA						
<i>Source of variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P- value</i>	<i>F crit</i>
between groups	0.001342	1	0.001342	8.916418265	0.013666	4.9646
within groups	0.001505	10	0.000151			
total	0.002847	11				

Hypothesis

Ho: There is No significant difference between BSE Sensex Monthly return of Mar - July and Other 7 Months.

HI: There is significant difference between BSE Sensex Monthly return of Mar – July and Other 7 Months

The One-way ANOVA test identifies specific significant comparisons. As the p-value is less than 0.05 we reject the null hypothesis and it is clear that there is a significant difference between the BSE Sensex Monthly return of Mar - July and the Other 7 Months. From which investors can earn more returns during the months Mar- July compared with other 7 months. The results of these tests confirm that in the BSE Sensex there is a significant month-of-the-year effect.

FINDINGS

Analysis of the Monthly Effect

1. The analysis of the Monthly Effect reveals that during the whole study period, the Highest Mean Returns (3.624% for NSE Nifty, 3.523% for BSE Sensex) was recorded in March, and the Lowest/Negative Mean Returns (-1.580 % for BSE Sensex and 1.415% for NSE Nifty) was recorded in August for Indian stock market indices.
2. The year-wise analysis shows that the Highest Mean Returns (24.885 % for BSE Sensex and 24.601% for NSE Nifty) were recorded in May 2011 and the Lowest High Negative Mean Returns (-11.245 % for BSE Sensex and - 11.509% for NSE Nifty) were recorded in January 2021.
3. For March, followed by April, May, June, September, and October, Positive Returns were registered for Indian Indices. This indicates that there is a significant month-of-the-year effect in the Indian stock market with special relevance to March to July effect.
4. The One-way ANOVA test identifies specific significant comparisons. As the p-value is less than .05 we reject the null hypothesis and it is clear that there is a significant difference between the NSE Nifty Monthly return of Mar - July and the Other 7 Months. From which investors can earn more returns during the months Mar- July compared with other 7 months. The results of these tests confirm that in the NSE Nifty there is a significant month-of-the-year effect.
5. The One-way ANOVA test identifies specific significant comparisons. As the p-value is less than .05 we reject the null hypothesis and it is clear that there is a significant difference between the BSE Sensex Monthly return of Mar- July and the Other 7 Months. From which investors can earn more returns during the months Mar- July compared with other 7 months. The results of these tests confirm that in the BSE Sensex there is a significant month-of-the-year effect.

Analysis of Day of the Week Effect

1. The analysis of the Day of the week effect reveals that for BSE Sensex Highest Mean Returns (0.0463%) were recorded on Wednesday and the Lowest Mean Returns (-0.0431%) were recorded on Thursday. In the case of NSE Nifty Highest Mean Returns (0.09006 %) were recorded on Friday and the Lowest Mean Returns (-0.00251%) were recorded on Tuesday.
2. The One-way ANOVA test identifies specific significant comparisons. As the p-value is more than .05 we accept the null hypothesis and it is clear that there is no significant difference between BSE Sensex Daily return on Monday, Wednesday, Friday, and the other 2 days. From this, it is clear that investors can't earn more returns based on days of trading. The results of these tests confirm that in BSE Sensex Index there is no significant Day of the week effect.
3. The One-way ANOVA test identifies specific significant comparisons. As the p-value is more than 0.05 we accept the null hypothesis and it is clear that there is no significant difference between the NSE Nifty daily return on Monday, Wednesday, Friday, and the other 2 days. From this, it is clear that investors can't earn more returns based on days of trading. The results of these tests confirm that in NSE Nifty Index there is no significant Day of the week effect.

CONCLUSIONS

The researcher has examined broad-based Indian stock market indexes for the period January 2011 to December 2021 and one calendar effect. First, I have identified a Mar- July effect, such that mean returns for the month's March to July are significantly greater than mean returns during the remaining seven months of the year. Second, I have identified a Mar-to-May effect, whereby mean returns for March through May are significantly less than those during the remaining months. But the day of the week effect is not identified in Indian Markets. Even though there is a slight variation in daily returns from Indian stock markets on different days during a week, the variations are not enough significant to establish a day of the week effect.

The Indian stock market has grown substantially in recent years, and it appears that the Indian economy is still in transition, so findings from earlier studies may evolve as additional data become available for subsequent years. Calendar effect studies should be re-examined over time, particularly when stock market characteristics change rapidly. For the sample period examined in this study, the Mar-to-July monthly returns generated significantly higher returns than those for the other months of the year. The investment community and researchers alike are eager to understand the behaviour of the Indian stock market. I believe that my study makes both timely and useful contributions to an understanding of calendar effects in the Indian stock market. I suggest, however, that the results of this study should be considered a preliminary anecdote. I encourage researchers to further examine calendar effects in the Indian stock market and to update the conclusions of my study.

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