AN ANALYSIS OF HOLIDAY ANOMALY ON S&P BSE BANKEX IN INDIA WITH REFERENCE TO POST ROLLING SETTLEMENT PERIOD

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Abstract: 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 Holiday Anomaly on S&P BSE BANKEX index. The results of this study will be useful to investors, traders, and arbitrageurs who can formulate profitable trading strategies to capitalize on calendar anomalies. The Securities and Exchange Board of India (SEBI) introduced the Compulsory Rolling Settlement System for stocks on January 02, 2002. This was expected to boost liquidity and thereby reduce the market risk of stocks to a considerable extent. The introduction of Rolling Settlement was also expected to lead to higher equity turnover and thereby potentially impact the anomalous behaviour of stock prices. In this context, the study provides further evidence on the anomalous behaviour of stocks in the Indian Stock Market during the Post Rolling Settlement Period from April 2002 to March 2016. The post rolling settlement testing period distinguishes this study from other contemporaneous studies on anomalous behaviour of stocks in the Indian stock market. This study considered the preholiday return and the post-holiday return and the influence of National holiday on the return. The six National holidays considered for the study are New Year, Republic Day, May Day, Independence Day, Gandhi Jayanthi and Christmas. The result of the study found that there was highest mean return recorded on Pre-Holidays than the Post Holidays and Week Days during the study period.

Index Terms – **Seasonality,Holiday Anomaly,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. These include securities listed on a stock exchange as well as those traded privately. The stock market is the primary source for any company to raise funds for business expansions. If a company wants to raise capital for the business, it can issue shares of the company that is basically part ownership of the company. 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 study of equity returns has been an ever-intriguing field for researchers. Prediction of equity price movements and finding patterns if there exist any, is a largely explored area in finance research studies. The man aim of these researches is acceptance or rejection of efficient market hypothesis. The Efficient Market Hypothesis (EMH) relates to how swiftly and precisely the market acts in response to new information. New data are constantly flowing in the market place via economic information, company statements, political declaration, or public survey. If the market is informationally efficient then security prices adjust rapidly and accurately to new information. According to this hypothesis,

security prices reflect entirely all the information that is obtainable in the market. Since all the information is already integrated in prices, a trader is not able to make any excess profits. Thus, EMH proposes that it is not possible to do better than the market through market timing or stock selection. Against this Seasonal variation in different economies of world are a well-known fact. In recent years certain patterns have been found to exist in stock returns. Stock markets of different countries have exhibited regular and repetitive fluctuation in a time series, which occurs periodically over a span of time. This strong seasonal effect in stock market returns has been clearly established through many studies. The occurrence of such a phenomenon is referred in finance literature as "seasonal Anomaly". Seasonal anomalies are also known as seasonality or Calendar 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. In this time stock market have statistically very high tendency of either to move up or to fall. As these effects are related to calendar (as day of the week, month of the year etc), they are called calendar anomalies.

There are large numbers of calendar anomalies documented by researchers and continues to grow. Prominent reported calendar anomalies include Day of the week effect, January effect, turn-of-the month effect, turn-of-the-year effect, and holiday effect. The knowledge of anomalous patterns in stock markets provides an opportunity to investors to earn excess profit simply by following certain calendar rules.

Anomalies, after documented and analyzed by researchers often seem to disappear, reverse, or attenuate. Hence, an attempt to test the efficiency of the market and identify the existence of the market anomalies become pertinent. In the present research, an attempt has been made to analyse the holiday effect in the S&P BSE BANKEX index in India.

1.1 Holiday Effect

The holiday effect refers to the tendency of the market to do well on any day which precedes a holiday. According to the Holiday Effect, the stock shows abnormally high return on days prior to Holidays. That is when returns are found higher in pre- holidays in comparison to Post holidays, the possible reason is that the investors tend to buy shares before holidays because of high spirit and excitement. To measure the Holiday Effect, the trading days have been classified into three categories such as, Weekdays, Pre-Holidays and Post Holidays.

     Weekdays is the day which has both at least one preceding and one succeeding day as trading days.

     Pre-Holidays is the day which has at least one preceding day as trading day but at least one succeeding day as holiday.

     Post-Holidays is the day which has at least one preceding day as holiday, but at least one succeeding day as trading day.

2.RESEARCH METHODOLOGY

2.1 Objectives of the study

1.To test the existence of Holiday effect on stock return.

2.To test the efficiency of the stock market.

3.To develop trading strategy for investors based on the calendar effects.

2.2 Hypothesis of the study

The following Hypotheses was developed and tested. H01: There is no significant difference in the mean returns among the pre, post holidays and weekdays.

2.3 Methodology of the study

2.3.1 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 day of the week effect on BSE healthcare index 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 1 April 2002 to 31 March 2016** (i.e. Post Rolling Settlement Period).

2.3.2 Sources of Data Collection

The main sources of data are given below:

• Financial Dailies: The Economic Times, India, Financial Express, India.

• Journals / Magazines: Business India, Capital Marketdata Street, Economic and Political Weekly and 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: Bombay Stock Exchange: www.bseindia.com

2.3.2 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 for all sample stocks.

2.3.4 Software Packages

EVIEWS 9 has been used for the econometric modeling.

2.3.5 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) To test the stationarity of the data, **Augmented Dickey-Fuller (ADF) test** is used where the null hypothesis is that the series have unit root(non-Stationarity).

(iv) **Linear Regression Model** is a standard methodology that is initially employed to test the holiday effect.

3. REVIEW OF LITERATURE

1.**Madhusudan Karmarkar, Madhumitha Chakraborty (2000)**[1] in their study "**Holiday Effect in the Indian Stock Market**", examined the Holiday Effect and found out that stock showed abnormally high return on days prior to holidays. This study investigated the Holiday Effect in the Indian Stock Market by comparing the mean return of Pre-Holiday, Post-Holiday and Weekday.

2. **Dr. Dhaval Maheta (2014)**[2] in his research "**Festival Effect in the Indian Stock Market**" investigated the effect of festivals on the return of selected stock indices of Indian stock market. The researcher took the closing price of two indices i.e. Sensex and Nifty from January 2003 to December 2012 and applied paired t test on daily return series. The findings revealed that there is a significant influence of festivals like Holi, Janmashthami and Diwali on the mean return of selected indices. Thus, there is existence of excess return during the post period of Holi, Janmashthami and Diwali. Further, the market is not informally efficient, and customer can avail the maximum opportunity to obtain greater returns during these festivals.

3. **Miguel Balbina** Nuno C. Martins(2002)**[3] in their paper "**The analysis of calendar effects on the daily returns of the Portuguese stock market: the weekend and public holiday effects**" analyzed the presence of calendar effects on daily returns of the Portuguese stock market index(PSI Geral index) for the period from 1988 to 2001.The linear regression model methodologies, histograms and analysis of the return averages were used in the study.The findings revealed the existence of a week- end effect in the Portuguese stock market that tends to fade away over the sample period, suggesting that this anomaly will be discontinued in the future as a result of the capital market development. The evidence of the weekend effect was consistent with the reduction felt also in the changes in returns around public holidays. In general, the trend of the behaviour of returns coincides with the changes observed in the Portuguese market that has become more sophisticated and integrated in the international context.

4. ANALYSIS

3.1 Analysis of Daily Returns of Pre-Holidays, Post Holidays and week days for S&P BSE BANKEX Index

3.1.1 Analysis of Descriptive Statistics for S&P BSE BANKEX Index

The Results of Descriptive Statistics for S&P BSE BANKEX Index from April 2002 to March 2016 are presented in **Table-1.1.** The analysis of the study clearly shows that the Pre-Holiday mean rturns was higher (0.2042) than the returns ofother Days i.e. Post-Holidays and Week Days. The lowest value of mean return (0.0315) was recorded on the Week Days. The risk of the return distribution (Standard Deviation) was High (1.73) for the Post Holidays and the Lowest risk was recorded on the Weekdays.

[1] Madhusudan Karmakar, Madhumitha Chakraborty (2000). Holiday Effects in the Indian Stock Market. Finance India. 14(1): 165-172.
[2] Dr. Dhaval Maheta (2014), "Festival Effect in the Indian Stock Market", Peer Reviewed International Journal, Vol.2, Issue.5, pp.1-8.
[3] Miguel Balbina** Nuno C. Martins (2002) "The analysis of calendar effects on the daily returns of the Portuguese stock market: the weekend and public holiday effects", Banco de Portugal Economic bulletin, Vol.3, Issue.1, pp.31-38.

The peak of the returns distribution was Platykurtic on week days and leptokurtic on pre-Holidays and post Holidays. Its value is more than 3. The return distribution was negatively skewed on Pre and Post Holidays, but positively skewed during week days. This indicates that the S&P BSE BANKEX index returns observed more negative values during Pre and Post Holidays.

Table 1.1

The Results of Descriptive Statistics for S&P BSE BANKEX Index Returns for Pre, Post-Holidays and Weekdays from April 2002 to March 2016

Statistics	Pre Holidays	Post Holidays	week Days
Mean	**0.2042**	0.0696	0.0315
Standard Error	0.0719	0.0784	0.0412
Standard Deviation	1.9794	2.2364	1.8052
Sample Variance	3.9182	5.0014	3.2588
Kurtosis	5.2067	8.5742	3.0090
Skewness	-0.6151	-0.0296	0.1841
Sum	154.62	56.62	60.45
Count	757	814	1917

Source: Computed from MS. Excel

Chart 1.1 reveals the Results of Average Daily Returns of Pre-Holidays, Post-Holidays and Weekdays for S&P BSE BANKEX Index from April 2002-March 2016. The above chart shows that the Pre-Holiday return was higher than the mean return of Other Days. The least return was reported on Weekdays during the study period.

Chart 1.1

Average Returns of Pre, Post-Holidays and Weekdays for S&P BSE BANKEX Index from April 2002 to March 2016
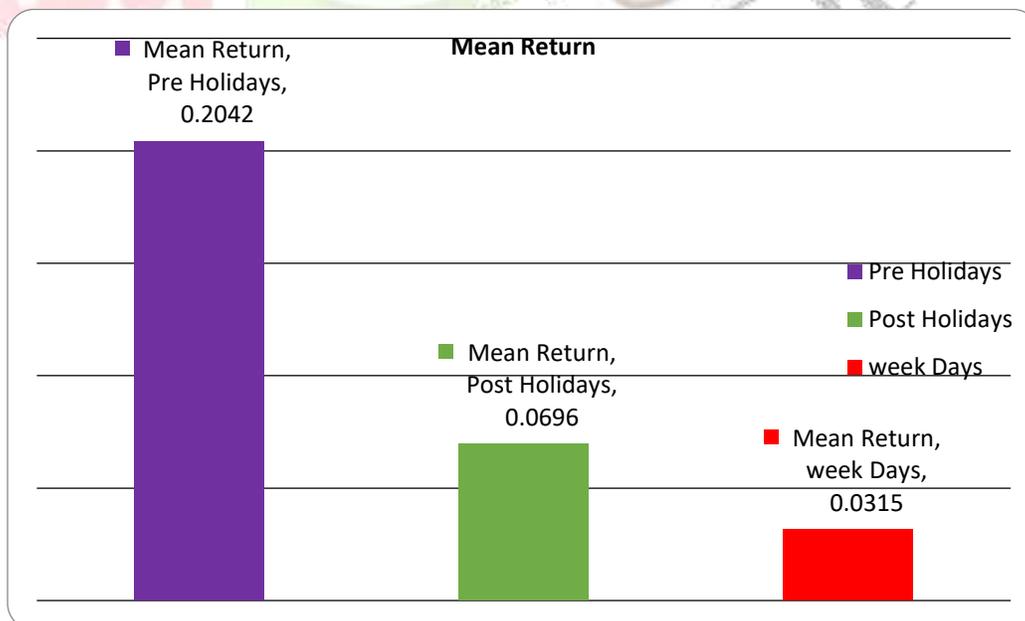
Source: Computed from Table 1.1

3.1.2 Analysis of Linear Regression Model for S&P BSE BANKEX Index

The Results of Linear Regression analyses for S&P BSE BANKEX Index from April 2002 to March 2016 are given in **Table 1.2.** The table found that there was negative coefficient value of Post Holidays and Week Days. And also the week Days return were negatively significant at 5% level. The coefficient value of Pre-Holidays was positive and significant at 1% level. It is found that there was significant difference between the returns of Pre-Holidays and Other Trading Days.

It also found that the returns of Pre-Holidays and Week days are moving opposite direction. That means the Pre-Holidays return were going upwards and the Week Days returns were moving downwards during the study period. Further the low R-squared value of 0.0013 reveals that the dependent variables contribute less than one 1% to the independent variable.   The F-value was 2.21and it is insignificant. It clearly indicates that the Pre-Holiday Effect was not significantly observed in the S&P BSE BANKEX Index Returns during the study period.

Table 1.2

The Results of Linear Regression Model for S&P BSE BANKEX Index Returns for Pre, Post-Holidays and Weekdays from April 2002 to March 2016

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Post Holidays	-0.1367	0.0984	-1.3898	0.1647
Week Days	-0.1757	0.0836	-2.1019	**0.0356***
C	0.2063	0.0707	2.9158	**0.0036****
R-squared	0.0013	Akaike info criterion		4.1759
Adjusted R-squared	0.0007	Schwarz criterion		4.1812
F-statistic	2.2191	Hannan-Quinn criter.		4.1778
Prob(F-statistic)	0.1089	Durbin-Watson stat		1.7463

Source: Computed from E-Views

**Significant at 1% level.

*Significant at 5% level.

5. FINDINGS AND SUGGESTIONS

➢ The result of the study found that there was highest mean return recorded on Pre-Holidays than the Post-Holidays and Week Days during the study period.

➢ The lowest mean return was recorded on Week Days in the study period.

➢ The Highest Value of Standard Deviation was recorded on the Post Holidays and the Least Value of Standard Deviation was recorded on the Weekdays.

➢ It means the market was more volatile during the Post Holidays and least volatile during the week days.

➢ So it is suggested that the investors may carefully making the investment decision in this type of risk and return relationship.

➢ It is to be noted that the abnormal Pre-Holiday return was not attributable to the increased risk. Hence investors are advised to sell their holdings on Pre-Holidays. It will give better returns to the investors.

➢ The most plausible reason may be the Pre-Holiday Effect is the news of depressed stock prices that tend to come at the Weekend. It is to be noted that the Good News are generally released only on the days before the market closure.

➢ Further the F-value was low and insignificant F-value. It clearly indicates that the overall fit of the model is poor. And also, the Durban-Watson Statistics indicates that autocorrelation in the residuals.

➢ Hence, the Pre-Holiday Effect was observed in the sample sectoral Index Returns during the study period. Hence investors are advised to note the above facts before investing.

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