HOLIDAY EFFECT IN SELECT ASIAN STOCK MARKETS

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ABSTRACT

This study seeks to examine the existence of holiday effect in two Asian Stock Markets, Singapore and India. India and Singapore seem to have similar traditions. Many hindus, being the citizen of Singapore celebrate Diwali and worship Buddhism, which was preached by King Siddartha (then part of India). Keeping in mind this fact, the daily closing prices and stock returns are regressed to investigate the existence of pre-holiday and post-holiday effect in the two countries and during the common holidays from a period of 1992 to 2018. It was found that in both the countries the pre-holiday effect did not exist. It had been replaced by the post-holiday effect. Even though Singapore is developed, the post-holiday return was found to be significant in this country. Among the specific holidays, the New Year and the Good Friday could attract the attention of investors at 10% significance level in post-holiday period. As for India, none of the holidays but the trading days not-corresponding a holiday provided significant return at 10% level in post and pre-holiday analysis. The post-holiday effect was however found in the form New Year effect in India at 5% significance level. The Common holiday like Deepwali did not achieve the returns significant enough at 5% or 10% level, neither in pre-holiday period nor in post-holiday.

Keywords: Holiday Anomaly, New Year, Good Friday, Diwali, Singapore, Student t test, Stock Market.

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INTRODUCTION

Efficient market hypothesis was introduced by Prof. Eugene Fama in 1965. Prof. Fama defined Efficient Markets as the place where the market prices fully reflect the new information and no man can take the advantage of the information for personal gain as the new information is adjusted in the market prices instantaneously. The professor came with three types of market situations, the weak form, the semi-strong form and the strong form. It is the weak form of hypothesis where stock prices already reflect all the information contained in the history of the past prices, is being tested in the present study. As per the literature the holiday effect is an anomaly that provides significant positive return before or after a holiday. The present study therefore seeks to examine whether there is existence of holiday effect in two countries that have a similar tradition and value system.

The countries in question are Singapore and India. As one goes down the history, in Gupta dynasty, Singapore was part of India. At this time, many Hindustani would have travelled from India to Singapore (being part of the same ruler). As we know today, Lord Rama is worshiped in Singapore, similar to India. Diwali is a festival that welcomes the return of King Rama from 14 years of exile is celebrated in both the countries. Further, the preaching of Buddha was spread equally to the boundaries of Singapore and India.

Among the Asian countries, Singapore is considered the developed country while India is a developing nation, more specifically an emerging one. It becomes therefore necessary to question whether the investor can take advantage of the anomaly globally or only in developed nations like USA or UK.

REVIEW OF LITERATURE

The anomalies were first studied by M.J. Fields (1934) using the daily stock returns. The daily stock returns were used by the analyst to study the pre-holiday effect. Cadsby and Ratner (1992) studied the European stock market, but could not find the evidences of the anomaly.

Wong et al (1990) examined the returns of six sectorial indices of Kuala Lumpur Stock Exchange consisting of industry, finance, hotel, property, tin and plantation. All the indices exhibited the existence of Chinese New Year Effect and that the impact of this anomaly could be seen well before the first day of Chinese Lunar Calendar. Chan, Khanthavit and Thomas (1996) studied the stock exchange of Malaysia and Singapore. They found a stronger holiday anomaly before a cultural holiday. Lakonishok and Smidt (1988) studied Dow Jones Industrial Average over a period of ninety years. They found that the returns performed exceptionally well during the days between the holidays especially the two cultural holidays namely, Christmas and New Year. Yakob et al (2005) examined Asian Pacific countries including Australia, China, Hong Kong, Japan, India, Indonesia, Malaysia, Singapore, South Korea and Taiwan. Their study found that the Chinese New Year effect existed in four out ten countries. Abidin, et al (2012) examined the daily prices of seven Asian stock markets namely Hong Kong, Japan, Malaysia, Singapore, Taiwan, South Korea and New Zealand during January 1992 to October 2011. The study emphasised on the impact of cultural holiday than the public holiday. It found Chinese New Year Effect, a cultural holiday effect in Hong Kong, Japan, Malaysia, Singapore, South Korea and Taiwan.

Ariel (1980) also examined trading day prior to holidays in USA. During the period from 1963 to 1982, the study found that over one third of the total return that accrued to the market portfolio was earned in eight trading days before the holiday closing. Lakonishok and Smidt (1988) found half of the gains were on ten trading days prior to holiday in each year. Yen and Shyy (1993) examined the Chinese New year effect for five days prior to holiday and ten days after the holiday in whole of Asian markets. The study found the evidences of Chinese New year Effect. McGuinness (2005) examined daily stock return in Hang Seng during 1975 to 2005. He found that the stock return would increase prior to Chinese New Year. Abidin, et al. (2012) found Chinese New Year effect in five days prior and five days the holiday.

Ziemba (1991) investigated seasonal irregularities through holiday effect for a period of approximately 40 years from 1949 to 1988 for Topix stock Exchange.

Three days prior to holiday and two days post-holiday were regressed to see the impact of pre-holiday effect. It also defined golden week effect as three holidays in a set during April end and early May. The study found return to be higher five times than the return on other days than prior to a holiday. And the impact golden week was found to be significant during April 29, May 1ˢᵗ to May 4ᵗʰ. The post-holiday return was found to be negative.

Kim et al. (1994) examined the holiday effect in three stock markets of USA. They found abnormally high returns on trading days prior to holidays in all the major indices, the NYSE, the AMEX and the NASDAQ. The study also found holiday effect present in England and Japan. No correlation was found in the existence of the effect in USA, UK and Japanese stock market and also due to size effect. Marrett and Worthington (2007) examined Australian stock market using daily stock returns at market and industry level and small capitalisation stock. They analysed eight holidays and found pre-holiday effect in small cap stocks and at market level but at industry level only in retail sector. The post-holiday effect could not be found in any sector or at any level. Tanizaki (2004) examined the strategies and associated economic gain as return from the holiday effect using DJIA. The study analysed additionally the impact of holiday effect on the funds allocation in real time and measured the variability in expected and actual returns during the trading days. The study also used the SV model, benchmark plain vanilla SV model to see the economic gain from pre-holiday, post-holiday, pre-long weekend and post-long weekend. The study found higher mean and lower volatility of pre-holiday, post-holiday and pre-long weekend and concluded that the holiday effect was conditioned economically and statistically. Bashir and Zeb (2015) studied the impact of holidays in S&P 500 on the pre-holiday return of East Asian Stock market especially when no trading was taking place in Taiwan, China and Japan. The study used T-GARCH and found that Chinese Stock market had the minimum spill-over compared to other countries. They found a different holiday effect and that the returns and risk of inter-linked markets were affected by the holiday return.

DATA AND METHODOLOGY

The daily closing prices of STI (Singapore) and Nifty 50 (India) during a period from 1st January, 1992 to 31st December, 2018 has been used. The closing prices have been converted into returns using the natural log as $Rt = \ln(Pt/Pt–1)$. The natural log uses the daily difference of the closing prices of market to compute the return. The return has been divided into pre-holiday return and post-holiday return. The pre-holiday return is a trading day before a holiday. Similarly, post-holiday is a trading day after the holiday. The pre-holiday return and post-holiday return has been regressed using dummy variables:

$$R_t = a_0 + b_1 D_{pre} + b_2 D_{post} + e_t \qquad (1)$$

Where,

D_{pre} takes the value 1 when the trading day falls before a holiday, zero otherwise. D_{post} takes the value 1 when the trading day falls after a holiday, zero otherwise. 'a_0' is the average return for all days excluding those preceding or succeeding a holiday. b_1 is the difference in return between pre-holiday days and other days not corresponding a holiday and b2 is the difference in return between the post-holiday and other days not corresponding a holiday.

Further, national holiday for each country has been identified. There are seven national holidays from Singapore and six national holidays from India that become part of this study. Singapore included New Year, Chinese New Year, Good Friday, Labour Day, National Day, Deepawali and Christmas as holidays. India included New Year, Republic Day, Holi, Labour Day, Diwali and Christmas.

From the eq. 1, return before or return after individual holiday cannot be tested. The regression equation for each country thus is,

$$R_{st} = a_0 + a_1 D_{NYR} + a_2 D_{CHINESE-NYR} + a_3 D_{GFRI} + a_4 D_{LABR} + a_5 D_{NATNL} + a_6 D_{DEEP} + a_7 D_{CHRIST} + e_t \qquad (2)$$

Where, 'R_{st}' is the return in the period t in Singapore. 'a_0' is the average return for all days excluding those preceding a holiday. a_1.. to ..a_7 are the coefficients that reflect the difference in return between trading day before the respective holiday and other days not corresponding a holiday. D_{NYR} is the dummy variable that takes the value 1 when it is trading day is before a New Year, zero otherwise. $D_{CHINESE-NYR}$ is the dummy variable that takes the value 1 when it is trading day before Chinese New Year, zero otherwise. Similarly other dummy variables D_{GFRI} , D_{LABR} , D_{NATNL}, D_{DEEP} ,D_{CHRIST} take the values of one or zero.

$$R_{it} = a_0 + a_1 D_{NYR} + a_2 D_{REPUBLIC} + a_3 D_{HOLI} + a_4 D_{LABR} + a_5 D_{DIWALI} + a_6 D_{CHRIST} + e_t \quad (3)$$

Where, 'R_{it}' is the return in the period t in India. 'a_0' is the average return for all days excluding those preceding a holiday. a_1.. to ..a_6 are the coefficients that reflect the difference in return between trading day before the respective holiday and other days not corresponding a holiday. D_{NYR} is the dummy variable that takes the value 1 when it is trading day is before a New Year, zero otherwise. $D_{REPUBLIC}$ is the dummy variable that takes the value 1 when it is trading day before Republic Day, zero otherwise. Similarly other dummy variables D_{HOLI} , D_{LABR} , D_{DIWALI} and D_{CHRIST} take the values of one or zero.

Eq2 has been used to test the pre-holiday return and post-holiday return before or after the specific holidays in Singapore. Similarly, the Eq 3, has been used to test the pre-holiday return and post-holiday return, before or after the specific holidays in India.

EMPIRICAL FINDINGS

The analysis progresses on the results from one method to another. First the paired sample t test was used to analyse the difference between the pre-holiday and post-holiday return.

Analysis of student t test on the difference between pre-holiday and post-holiday return

The empirical result of paired sample student t-test for two Asian countries during January 1, 1992 to December 31, 2018 is shown in the table **1.** The number of observations in each market is different depending on the number of holidays studied and the availability of daily closing prices in each country. In Singapore, the pre and post-holiday return has been taken from 1992 to 2018, making it equal to 27 years and the holidays studied are seven. The total number of observations therefore are approximately 27 years X 7 holidays = 189 returns. The return from New Year holiday could not be gathered for the initial years of the study, the total number of observations move down to 188. For India the data could be captured from 1993 to 2018, for 26 years, the number of holidays studied are 6, the total number of observations would then be 21 years X 6 holidays = 156 observations.

Table 1: Paired sample t test to analyse the difference in mean during pre and post-holiday

Parameters	Singapore	India
Number Of Observations	188	156
Pre-Holiday Return (Mean %)	0.0125	0.1324
Post-Holiday Return (Mean %)	0.2160	0.2512
Mean Difference (%)	-0.2035	-0.1188
Correlation	0.179	0.152
t-Value	-2.043	-0.685
p-Value	0.042	0.494
S.D.	.0137	.0217

The percentage of mean of pre-holiday and post-holiday return is positive in India. The mean percentage of post-holiday return in Nifty 50 is higher than that of pre-holiday return resulting into negative value for mean difference in pre and post-holiday. The correlation between the two types of return (pre and post-holiday) is nearly the half of the correlation in China at 0.152. The t-value is also negative and p-value exceeds the critical value of 0.05. Similar implications are meant for India. The null hypothesis that the pre-holiday return is not significantly different from post-holiday return is accepted at 5% significance level.

However, Singapore is showing significant p-value at 5% sig. level. The p-value is less than 0.05. The null hypothesis that there is no significant difference between the pre-holiday and post-holiday return is not accepted. There is a significant difference in the mean return between the pre-holiday and post-holiday return. The percentage of mean difference is negative indicating post-holiday return has more potential to attract the investors.

Analysis of Linear Regression model for pre-Holiday and Post-Holiday Return

The coefficients of pre-holiday return and post-holiday return have been regressed using ordinary least square. The result in table 2, confirmed the result found in table1. The post-holiday effect is found to be high compared to pre-holiday return and significant in Singapore at 5% significance level.

Table 2: Regression coefficients of pre and post-holiday return during 1992 to 2018

Country	a	t(a)		b1	t(b1) pre	b2	t(b2) post
Singapore	9.48E-05	0.687		1.05E-05	0.013	0.002	2.498*
India	0.0003	1.613		0.001	0.939	0.002	1.525

*5% =1.96(prob.)   **10% =1.69(prob.)

Analysis of Linear Regression Model for pre-holiday return of individual holidays in Singapore

In table 3, coefficients and the t-value related to the pre-holiday return (b1) in seven individual holidays is displayed. None of the t-values satisfy the critical value at 5% significance level. All the holidays instead are giving negative return. And some of the holiday like Good Friday and Labour that are delivering positive return are meagre to attract an investor's attention. Only Deepwali is providing high pre-holiday return among the seven holidays studied in Singapore. Since none of the holidays are able to provide significant positive returns, the null hypothesis that the stock returns are significantly higher in particular holiday than in other holidays is not accepted at 5% significance level.

Table 3: Regression coefficients of pre-holiday return from individual holidays in Singapore

Regular days and Holidays	Coefficients	t-Value
Not Corresponding A Holiday	0.0002	1.1213
New Year	-0.0002	-0.0740
Chinese New Year	-0.0025	-1.2035
Good Friday	0.0012	0.5542
Labour Day	0.0017	0.8042
National Day	-0.0037	-1.7534
Deepawali	0.0027	1.2820
Christmas Day	0.0006	0.2919

*5% =1.96(prob.)   **10% =1.69(prob.)

Analysis of Linear Regression Model for post-holiday return of individual holidays in Singapore:

In the table 4, the post-holiday return (b2) is found significant at 10% level

corresponding to two holidays, the New Year and the Good Friday. Both the holidays are celebrated globally and with industrialisation and globalisations, many countries have opened doors for skilled people to work with them. As the movement of people from the Christian or English speaking countries to countries practicing Buddhism, the cultural holiday seem to play lesser role in attracting an investor at post-holiday return. Neither the Chinese New year nor Deepawali seem to be providing high returns, post the holiday.

Table 4: Coefficients of post-holiday return among different holidays in Singapore

Regular days and Holidays	Coefficients	t-Value
Not Corresponding a Holiday	0.0001	0.7048
New Year	0.0037	1.7655**
Chinese New Year	0.0029	1.3823
Good Friday	0.0037	1.7613**
Labour Day	0.0027	1.2552
National Day	-0.0007	-0.3459
Deepawali	-0.0009	-0.4399
Christmas Day	0.0027	1.2994

*5% =1.96(prob.)   **10% =1.69(prob.)

The values can be easily understood if presented through a bar chart as shown below in figure 1.

Figure 1: Pictorial presentation of t values in table 4
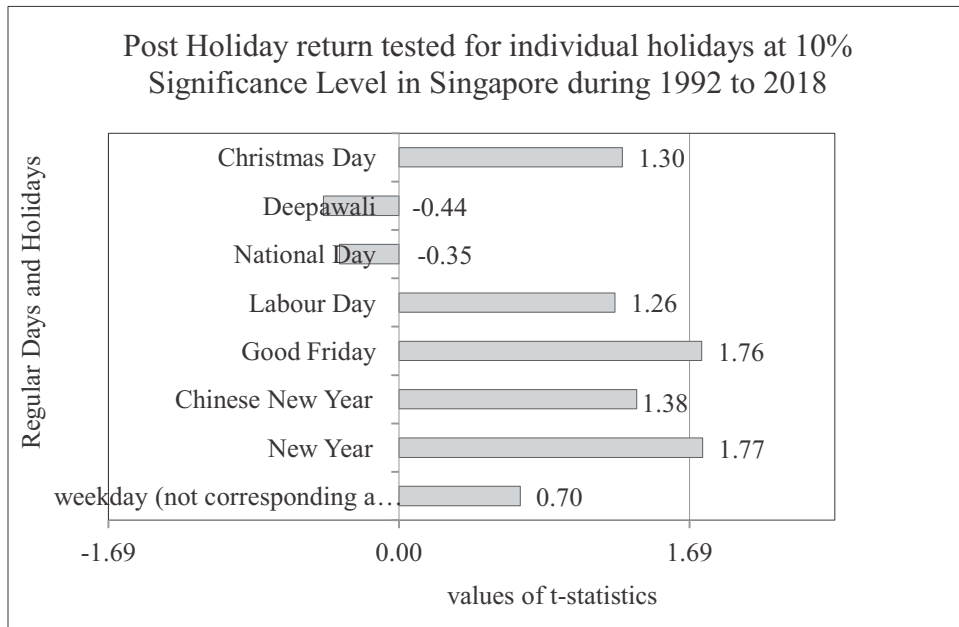
The values at 10% level has been tested and shown in figure 1. One can clearly see the excess return on the day that occurred after the New Year day and Good Friday. The rest of the holiday, those on account of Chinese New Year, Labour Day and Christmas were also generating high positive post-holiday return. The cultural festival did well in pre-holiday analysis but the investor was disappointed by return in post-holiday analysis.

Analysis of Linear Regression Model for pre-holiday return of individual holidays in India

In table 5, coefficients and the t-value related to the pre-holiday return (b1) in *six* individual holidays from India is displayed. The excess pre-holiday return from all the holidays is positive except from Holi and Christmas. The return provided by

trading day not corresponding a holiday is found to be significant at 10% level of significance.

Table 5: Coefficients of pre-holiday return from individual holidays in India

Regular days and Holidays	Coefficients	t-Stat
Not Corresponding to a Holiday	0.0004	1.8887**
New Year	0.0026	0.7863
Republic Day	0.0043	1.3235
Labour Day	0.0026	0.8119
Holi	-0.0017	-0.5348
Diwali	0.0008	0.2517
Christmas	-0.0006	-0.1831

*5% =1.96(prob.)   **10% =1.69(prob.)

Analysis of Linear Regression Model for post-holiday return of individual holidays in India

In the table 6, the return provided by trading day not corresponding a holiday is found significant at 10% level of significance. This result is similar to result shown in table 5. The change in table 6 from table 5 was with regard to New Year Effect. The excess return (b2) was found significant at 5% level of significance from post-holiday return of New Year holiday. Other holiday provided positive return during the period except for the Christmas and Republic Day. Comparing the return from Diwali in pre-holiday analysis and post-holiday analysis, in both the times, Diwali was not generating a negative return unlike in Singapore. Holi was giving positive return after the holiday than before the Holi. Opposite is the result of republic day. Before the Republic day, the return was highest among all the holidays, after the republic day, the return came down to the lowest negative position. Christmas was providing the negative returns both before the holiday and after it. Only the New Year has shown the leap change in return before a holiday or after it.

Table 6: Coefficients of post-holiday return among different holidays in India

Regular days and Holidays	Coefficients	t-StatNot
Corresponding to a Holiday	0.0004	1.8121**
New Year	0.0089	2.6769*
Republic Day	-0.0010	-0.2942
Labour Day	0.0006	0.1811
Holi	0.0018	0.5387
Diwali	0.0029	0.8821
Christmas	-0.0007	-0.2259

*5% =1.96(prob.)   **10% =1.69(prob.)

Figure 2: Pictorial presentation of t values in table 6

Post-holiday return tested at 5% Significance level for Individual Holidays in India during 1992 to 2018
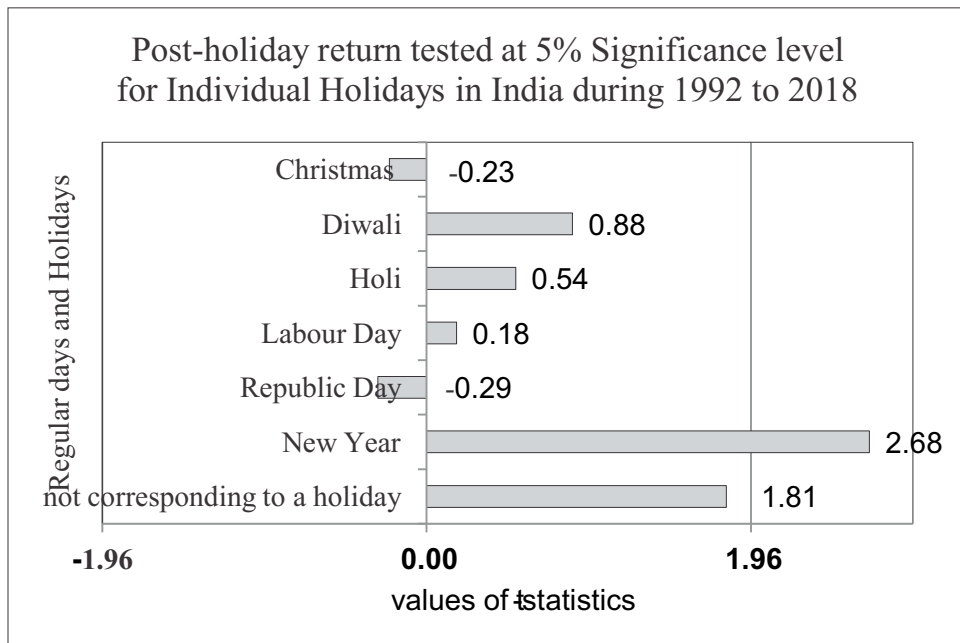
The figure 2 gives a better picture of the analysis by presenting the values of t-statitics in horizontal axis and individual holidays and other days not corresponding a holiday on the vertical axis. The excess and significant return from New Year after the holiday could be earned in India during the study period. Not just this the investment from other days than a holiday would not have disappointed the investor as the return was found significant at 10% significance level as shown in figure 2.

CONCLUSION

The paper contributed to the research work relating to pre-holiday effect by including post-holiday effect as well in the analysis. The results from paired sample t test and later from regression of pre-holiday and post-holiday return prompted the study, to analyse deep into the post-holiday return by giving higher and positive post-holiday return and in effect, the negative mean percentage return. The popular belief of investor psychology to sell shares before a holiday (Brockman and Michayluk, 1998) in the holiday mood, in holiday excitement was refuted by this result. The reasons from the behavioural side, indicating short selling by investor as to save the risky position before a holiday, doesn't seem to justify here. Diwali or Deepawali provided positive returns before a holiday in Singapore but negative returns after Diwali. In this case, the investor sentiments with regard to holiday mood could be justified but this justification would take shape when the returns were significant. In India, both the pre-holiday and the post-holiday provided similar positive return before or after Diwali. For other common holidays like Labour Day where on one hand the return increased from before a holiday to after a holiday in Singapore, in India, the results reversed. During Christmas, the returns before a holiday increased to returns after the holiday in Singapore. In India, the Christmas could not give positive returns during pre-holiday nor post-holiday. The composite results were seen more clearly from New Year Holiday. Whereas, the returns increased from before the New Year to after the New Year in both the countries, significant positive returns (at 5%) were provided after the holiday in India. This makes one to conclude that it is the post-holiday era where the investor is not in a hurry to earn a return before a holiday. He is rational and optimistic about future return earned after the holiday.

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