

# Calendar Anomalies and Stock Returns: A Literature Survey

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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 towards the abnormalities in the stock returns. The focus of this literature survey is to review these various calendar anomalies that were observed over time in different stock markets around the globe. Calendar anomalies are basically defined as an irregular pattern of stock returns which are based on a calendar year. The anomalies analyzed in this literature survey include: the day of the week effect, turn of the month effect, January effect and the holiday effect. Different stock markets have been studied and analyzed to find evidence for the existence of these anomalies in those markets. A part of literature also discussed various strategies that can be adopted to exploit the anomalies that persist in the stock market. However, overtime some of these anomalies will completely vanish from the stock markets as markets become more and more efficient and trading requirements and procedures become more standardized.

*JEL classification:* G11; G12; G19

**KEYWORDS:** Event study, Calendar anomalies, Weekend effect, Holiday effect, January effect.

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## INTRODUCTION

Stock market anomaly is defined as an unusual pattern of stock returns that exist within the stock markets. These anomalies can be broadly classified as calendar, fundamental and technical anomalies. The focus of this literature survey is to review various calendar anomalies that were observed over time in different stock markets around the globe. These calendar anomalies also referred to as seasonal anomalies are responsible for irregular pattern of stock returns which are dependent on the calendar year.

A variety of calendar anomalies that has been analyzed in this survey include: the day of the week effect, turn of the month effect, January effect and the holiday effect. The day of the week effect, also known as the weekend effect exhibits relatively larger Friday returns as compared to Monday returns, where Friday is the last trading day of the week and Monday being the first. This is mainly attributable to the trading patterns of the individual investors. However, in the recent time period a reverse weekend effect has been observed where Monday returns have yielded more than the Friday returns contributed by the change in the trading pattern of investors. The increased trading activities of the institutional investors over the individual investors are responsible for the positive and larger Monday returns as compared to Friday returns. Turn of the month effect is the occurrence of higher returns towards the last few days of the previous month and first few days of the following month as compared to the returns on the rest of the trading days of the month. Some of the reasons accountable for this phenomenon are the cash flows received and new information arriving towards the end of the month. The cash flows are generated from the short term securities that mature towards the end of the month and any new information expected in the next month that would be beneficial for an investor would result in a higher trading activity towards the end of the month. The January effect explains high stock market returns in this month, which marks the beginning of the year. As quoted in the financial literature size, window dressing and tax loss selling are three key contributors of the high returns in January as compared to December returns. Small size stocks tend to generate higher returns in January as compared to large stocks. Institutional investors window dress their yearend returns by selling losers and holding back winners. Tax loss selling phenomenon indicates that stocks which are expected to have low yield (losers) towards the end of the year are sold off and stocks which are expected to earn more are held till the New Year, also referred to as the winner stocks. These stocks are then sold in January and thereafter the loser stocks replace winner stocks in a portfolio. Holiday effect demonstrates that pre holidays, a day immediately before the holiday in particular, stocks earn a much higher return as compared to the returns generated on post holidays.

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## II. The Day of the Week Effect/Weekend Effect

Lakonishok and Maberly (1990) provided an evidence for the existence of a weekend effect with respect to the trading of individual and institutional investors. The argument put forward in this article was that the trading patterns of the individual and institutional investors vary across the trading days of the week. Individuals trade more actively on Mondays as compared to the institutional investors. This was basically due to the reason that the individual investors have time on the weekend to make their investment decisions and then act upon them on the first day of the week which is a Monday. However, they engage more in sell transactions as compared to buy transactions. This is because they want to carry out sell transactions first according to the market situation and then plan on carrying out buy transactions. Secondly, individual investors want to know about the proceeds first which they would be generating and then would work on their reinvestment plans. One reason why institutional investors trade less on Mondays is because Monday is the first day of the week and institutions plan out on their investments on this day and then engage in the trading activity. Because of the less trading activity of institutional investors, the trading volume of NYSE declined as a whole.

In order to justify this trading behavior of the individual and institutional investors around the week, various tests were conducted. The data on daily NYSE trading volume and daily odd lot sales and purchases was gathered from the S&P's daily stock price record for NYSE. The time period under consideration was from 1962- 1986. For further analysis even the daily dollar volume of sales and purchases of NYSE's listed common stocks by Merrill Lynch cash account was taken into account.

It was apparent from the tests that the trading volume on Mondays had been the lowest as compared to all the other days of the week. The null hypothesis that the average trading volume is the same on all the days in a week was therefore rejected.

Another test demonstrated that Individual investors trade more actively on Mondays and since the t-statistic was significant at one percent level, null hypothesis, which stated that the average trading is the same across all trading days in a week, was therefore rejected. However, if Mondays were excluded from the tests, then the null hypothesis could not be rejected.

Kiyamaz and Berument (2003) inquired into the day of the week effect with respect to the stock market volatility and level of trading activity. Variation in stock returns caused by the amount of trading was also inspected. To address these issues, daily prices from the stock indices of five countries namely, Canada, Germany, Japan, UK and US (NYSE Index) were taken into account for the period 1988 to 2003. Returns from all these indices were exhibited in terms of local currencies.

Results revealed that lowest returns were observed for Japan on Tuesdays, for Canada, the United Kingdom and the United States on Wednesdays and for Germany on Fridays. On the other hand, highest returns were observed for the United States on Tuesdays, for Japan on Wednesdays, for Germany and United Kingdom on Thursdays and for Canada on Fridays. An overall positive trend of mean daily returns was detected for Canada, Germany, the United Kingdom and the United States while a negative trend was marked for Japan. It can hence be recognized that the distribution of the returns was not normal and rather skewed. However, the largest trading activity happened on Wednesdays for the United States and on Thursdays for the United Kingdom and Canada.

It was also recognized from the tests that Canada, Germany, the United Kingdom and the United States experienced positive coefficient for standard deviation whereas Japan experienced a negative coefficient. This rejected the null hypothesis that day of the week effect dummy variables were collectively equal to zero.

Tests on risk and return factors concluded that the Monday returns were lower than the returns on Wednesdays for the United Kingdom and Japan. For United States the returns were significantly lower on Thursdays and Fridays when compared with the returns on Wednesdays. Germany and Canada even though generated negative returns on Mondays, did not have much power to cause an effect in the results. On the other side, risk variable was also positive for Japan, the United States, the United Kingdom, Germany and Canada; thereby stating that there is a risk and return trade off. Investors would demand a higher return as a compensation for taking on higher risk.

The level of trading activity and its relationship with the returns' volatility was also looked upon. It was analyzed that high volatility in the stock returns on a particular day of the week will refrain the investors from making investments on that day and thus would reduce the trading volume .

Chiaku Chukwuogor –Ndu (2006) reviewed the financial markets' movements in fifteen upcoming and developed European countries. Fifteen European countries which were chosen for the sample are: Austria, Belgium, Czech Republic, Denmark, Germany, France, Italy, Netherlands, Russia, Slovakia, Spain, Sweden, Turkey, Switzerland and the United Kingdom. The time period under study was from 1997 till 2004.

Tests of the annual returns revealed that the ten indices out of fifteen experienced positive growth, Russia and Turkey experiencing massive growth amongst these. The other five indices registered negative growth. Overall annual returns displayed positive trend for the entire time period.

Tests for daily returns and day of the week effect provided evidence for the existence of day of the week effect as seven out of fifteen European financial markets experienced negative Monday and Wednesday returns. Generally,

highest daily returns occurred on Mondays, Thursdays and Fridays for some country indices. A test which was conducted for testing the day of the week effect found significant results for equality of mean returns in nine countries out of the total fifteen. These results supported the notion that day of the week effect did exist and so the null hypothesis which stated that there is no difference in the returns across all days of the week was therefore rejected.

Examination of the variation in the stock returns discovered that the distribution of the returns was not normal and rather skewed to the left. Huge variation in returns was witnessed for eleven indices out of the total of fifteen. The null hypothesis was therefore rejected which stated mean returns are equal across all days of the week.

Lian and Chen (2004) studied the existence of day of the week effect in the stock exchanges for five Asian countries over 10 years i.e. from 1992 to 2002. If this anomaly existed for certain days of the week, then it was also questioned if this existence was because of the instability of the stock market returns. The countries chosen for analysis were: Malaysia, Singapore, Indonesia, Thailand and Philippines. Because of the financial crisis in Asian markets in 1997, the time period under consideration was divided into three further categories. Period 1: from 1992 to 1997, period 2: from February 1997 to September 1998 and Period 3: from October 1998 till August 2002.

For conducting the tests, closing prices per day of the Kuala Lumpur Stock Exchange Composite Index, Singapore Stock Exchange All-share Index, Stock Exchange of Thailand Index, Jakarta Composite Index and the Philippines Composite Index were collected for 10 years.

Results for the tests of pre-crisis period revealed that the day of the week effect did exist for all the five countries, being most evident in Malaysia with negative Monday returns and positive Wednesday and Friday returns. Thailand and Singapore also exhibited the same results for Monday effect whereas Indonesia and Thailand's stock returns contained a Friday effect. Philippines had an entirely different result; it presented positive returns for Wednesday and Thursday. During the crisis period a Tuesday effect was present for Thailand and Philippines only. The day of the week effect which presented negative Monday returns and positive Friday returns was absent during the crisis period. Post crisis period displayed a positive Tuesday effect in Malaysia and Philippines and a positive Friday effect for Singapore. Thailand exhibited the same results in pre-crisis period while Indonesia presented a Thursday effect.

Tests for instability of stock returns in these five countries during all three periods revealed that for the first time period, the Monday effect prevailed in the stock returns of Malaysia, Singapore, and Thailand. Friday effect was present in the Indonesian stock returns and Philippines' stock returns had Wednesday and Thursday effect. So the presence of day of the week effect for these days' return was not explained by the instability of stock returns. Insignificant Wednesday and Friday effect for Malaysia and Friday effect for Thailand can be because of the variation in the stock returns. Results for the crisis period did not provide any evidence for the existence of day of the week effect because of the instability in the stock returns. Post crisis period concluded that for all the countries except Thailand, insignificant results were obtained which gave an indication that instability in the stock returns could be a factor behind the day of the week effect in these countries.

Brusa et al. (2005) explored the weekend and the reverse weekend effect in relation to the firm size and the investing patterns of the investors. In order to find out about the timing of the reverse of the weekend effect, mean daily returns of the CRSP value-weighted index from 1963 to 1998 were considered. The time period was further divided into a pre- 1988 and post 1988 time periods.

It was observed from the data that the weekend effect did exist in the pre-1988 period; Monday returns were not only negative during this time period but were also the lowest amongst the mean daily returns on the rest of the days of the week. On the contrary, Monday returns were positive for post 1988 period, which gave an indication of a reverse weekend effect in these later years. Three more indices were also included in the data set and those were: NASDAQ, S&P 500 and the DJIA indices. These indices also produced a similar result that was the existence of weekend effect during the pre – 1988 period and a reversal of this effect in the second time period except for the NASDAQ index that still presented negative but insignificant returns. Monday returns for the entire period were also negative mainly because of the dominance of the negative Monday returns in the first period. Therefore null hypothesis is rejected that stated that mean returns for other days of the week were zero.

Another factor that was likely to be responsible for the reverse weekend effect was the ownership structure of the stocks. Institutional investors who hold stocks of larger firms versus the individual investors who hold stocks of smaller firms were analyzed. Odd lot transactions were being considered for individual investors, whereas medium size and block trade transactions were being considered for institutional investors. The time period for investigation was from 1972-1998. It was analyzed that during pre 1988 period, Monday returns were negative which were due to the odd lot transactions which constituted a major portion of the trading activity. However, as the trading patterns changed in the later years when institutional investors were more active, it was observed that the Monday returns were positive in the post 1988 period and that too mainly because of the medium size and block trade transactions which were of the institutional investors. These results also proved that change in the formation of ownership did cause a reversal of the weekend effect.

A hypothesis that Monday and last Friday's returns were related was also tested with respect to the trading activities of the individual and institutional investors. DJIA and NASDAQ indices were looked upon for testing this hypothesis for the time period 1973-1998. For both the indices there was a positive relationship between Monday and Friday returns during the pre- 1988 period. A positive Friday return would lead a positive Monday returns as well and vice versa. However, in post 1988 period, DJIA index presented an opposite view when small stocks exhibited the same pattern again. Monday returns for DJIA index remained positive regardless of the returns being positive or negative on the previous Friday. This result was consistent with the hypothesis that large stocks were responsible for the reversal of the week end effect. In the later years the formation of ownership changed and institutional investors became more active in trading and had a greater impact on the results that were generated from the statistical tests.

Ariss et al. (2011) explored calendar anomalies in the stock markets of Gulf Cooperation Council (GCC) since its foundation till 2008. The study does not extend analysis beyond 2008 so as to avoid any sort of a bias that might have persisted because of the global financial crisis in 2008. The data regarding the closing prices of all GCC indices was taken from Global Financial Data. Ordinary least squares (OLS) with vigorous standard errors was the regression technique applied on the data.

Three main conclusions were drawn from the results regarding day of the week effect in GCC indices. First of all, positive and significant Wednesday returns were observed, Wednesday being the last trading day of the markets. These Wednesday returns were also the highest when compared with the returns on the rest of the trading days of the week for five indices out of seven. Lastly, it was also documented that similar returns' pattern was detected for Thursdays, where Thursday was the last trading day for some indices.

Joshi (2006) investigated the existence of day of the week effect in the trading practices of various industries at the stock market. The idea was to explore whether this anomaly existed in specific industries. The data was based on the trading report of Nepal Stock Exchange (NEPSE) provided by Securities Board. The study was conducted on a 10 year time period i.e. from 1995 to 2005.

From the tests conducted on NEPSE Index it was revealed that the average returns for Sunday (Monday for period 2) was insignificantly positive for all the time periods under consideration, so no evidence was found for the existence of day of the week effect for NEPSE index. Results from the tests of Connolly indicated that the average return for all trading days in a week was positive. At the same time it was also observed that the mean returns on first day of the week were higher when compared to the rest of the week

Tests conducted for industrial indices showed that during period 1 the average return for first day of the week were positive for five out of six indices. In time period 2, the average return for first day of the week was negative for all industries except for development banking. Mean returns for most of the industries remained positive during time period 3 as well. An interesting result was that the mean returns for most of the industries were positive where Sunday was taken as the first day of the week and negative for industries when Monday was considered the first day of the week. The author concluded that day of the week effect did not exist for all industries across all time periods in Nepal. It existed amongst a few industries and that too was vanishing.

Wong et al. (2006) tested the existence of calendar anomalies in the Singapore stock market. Straits times' index from DataStream international was used for analysis. The time period under consideration was from 1993 to 2005, which was further divided into two categories in order to incorporate the prominent effect of the financial crisis of 1997.

Results for day of the week effect presented negative Monday returns for the entire period as well as for the two time periods during a pre crisis period. During a post crisis period however, the difference between Monday returns and the rest of the week was immaterial, signifying a disappearing day of the week effect in Singapore.

Kenourgios and Samitas (2008) discussed the impact of calendar anomalies on the returns and riskiness of stocks listed on Athens Stock Exchange. The ten year period under study was divided into further two categories, each category including a five year period. For the first time period, daily closing prices for the General ASE index and three industry indices (banking, insurance and miscellaneous) were taken into account and General, Banking FTSE- 20 and FTSE -40 indices were considered for second time period.

The descriptive statistics reported the highest mean daily returns for banking index in the first time period and the lowest mean daily for FTSE-40 in the second time period. Variation in returns was also the largest for the Banking index for the second time period i.e. from 2001-2005. So, it was concluded that the results represented extreme values and so the distribution was not normal and rather skewed

Day of the week effect with the risk and return for all the indices in both time periods was then looked upon. Evidence suggested that Monday returns were less than the returns on Wednesdays. Wednesdays were excluded from the model in order to avoid the dummy variable trap. Monday's values for dummy variables for general, FTSE-20 and FTSE-40 indices were highly insignificant and negative for time period 1 and for miscellaneous index in time period 2 again indicating lower Monday returns in comparison with Wednesdays. Highest and significant values were witnessed on Fridays for general index and bank index for time period 1995-2000. However, the values

were insignificant for banking index during second time period. This gave an indication that the day of the week effect became weak in the later years and now did not have a significant impact on the returns and risk of the stocks. Other indices such as FTSE-20 and general ASE also indicated a similar pattern in the later years. FTSE- 40, however, demonstrated the opposite result. Volatility observed for all the indices during the first time period, supported the notion that day of the week effect did exist during that time period.

Therefore, it was concluded that the variation in returns during the two time periods was also dependent on the type of the index coupled with the various days of the week. General index had a higher variation in returns on Mondays, while banking index had higher variation on Fridays. FTSE-40 and miscellaneous indices observed a lower variation on Fridays and Tuesdays during the time period 1995-2000. However during the time period 2001-2005, it was evident that day of the week effect anomaly was not present in the conditional variance equation for all the indices considered for analysis.

### **III. Turn of the Month Effect**

Chen and Chua (2011) primarily investigated the existence of the turn of the month (TOM) anomaly in the S&P 500 index and in the exchange traded -funds (ETF) returns. Once the existence was verified, various strategies were then discussed which could help in exploiting the TOM effect. The data of daily prices for S&P 500 index and the ETF was collected from DataStream. The 3 month T-bill rate from January 1954 till April 2010 was obtained from Federal Reserve Board. The sample period under study for S&P 500 index was from 1950-2010 whereas for ETF it was from 1993 till 2010.

Two subsamples were developed from the data and then mean daily returns were calculated. Sample one was without the ETF trading whereas sample two incorporated the affect of ETF trading. It was evident from the significant results that returns for the S&P 500 index were higher during the TOM when compared with the returns during the rest of the month , thereby confirming the existence of the TOM anomaly during the time frame of sample one. ETF trading during the second time frame also presented similar pattern of returns.

The strategies that were discussed in the paper to take advantage of this anomaly are as follows: strategy one suggested investment in T bills during the non TOM days and then swapping it with Index funds during the TOM days. Strategy two recommended investment in T bills during the non TOM days and then swapping it with ETFs during the TOM days. Strategy 3 advised investment in index funds during the non TOM days and swapping it with ETFs during the TOM days. Strategy four proposed buy and hold ETFs whereas strategy five was buy and hold S&P 500 index funds. The results reported that strategy one underperformed the last strategy whereas strategy three outperformed it. The most effective strategy was the second last strategy that offered the highest possible returns.

Kok and Wong (2004) reviewed third month anomaly in five ASEAN countries during the time period involving the ASEAN financial crisis in 1997. Third month anomaly is basically when a particular month is divided into three sections and then returns in each of the sections is calculated and analyzed. First section incorporated returns from the 28<sup>th</sup> day of the previous month till the 7<sup>th</sup> day of the current month, second section included returns from the 8<sup>th</sup> day to 17<sup>th</sup> day of the month and the last section included returns from the 19<sup>th</sup> day till the 27<sup>th</sup> day of the month.

Five ASEAN countries included in the data were: Malaysia, Singapore, Thailand, Indonesia and the Philippines. The time period under study was from 1992 to 2002, which had been further divided into three categories. A pre-crisis period included a time period from 1992 to 1997, a crisis period from 1997 to 1998 and a post crisis period from 1998 till 2002.

During the pre crisis period all five countries presented different patterns of returns during different sections of the month. Malaysia, Indonesia and Philippines recorded highest average returns during the first section of the month whereas lowest returns were witnessed in the second section of the month by Malaysia and Indonesia.

No particular pattern of returns was witnessed during the crisis period. All the three time sections represented high volatility for the countries but they did not have any particular pattern of returns. In addition to this, it was concluded that there wasn't much difference between the average returns earned during different sections of the month as well.

During the post crisis period, highest returns were observed in the first section of the month for all the countries except Malaysia. Malaysia had the highest average return in the second section of the month, lowest being in the first section. Indonesia had the lowest and negative average return in the third section while Thailand, Philippines and Singapore had it in the second section. F-tests also revealed that only Indonesia displayed significant difference in the average returns generated in all the sections of the month.

Wong et al. (2006) also tested turn of the month effect. Data<sup>1</sup> remaining the same, the tests for the turn of the month effect exhibited higher returns at the turn of the month days as compared to all the other days of the month during the entire period included in the sample. A declining difference in the average returns at turn of the month

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<sup>1</sup> This article explains the day of the week effect, the turn of the month, the January Effect and the Holiday effect. The data description has already been mentioned in the day of the week effect's section

days and on the rest of the days of the month was displayed. This is again consistent with the results presented so far, that the calendar anomalies have retired in Singapore.

#### **IV. The January Effect**

Haug and Hirschey (2006) reviewed the January anomaly for large cap and small cap stocks by examining the value weighted and equal weighted returns. They also tested the existence of this anomaly for small cap stocks after the progression of the Tax Reform Act of 1986. Causes for January effect were identified as well by exploring the Fama and French's (1993) size, book to market and momentum factors.

For analyzing the January effect with respect to value weighted returns, monthly returns were computed from Schwert's indices of US stock prices for the time period 1802 to 1926 and from CRSP value weighted returns for the time period 1927 to 2004. Positive value weighted returns coupled with high volatility were observed for the month of January. January return premiums were also positive. A more prominent and positive effect of January returns and return premiums was obtained for second time period. This can be because of the Tax Reforms of 1987 which encourages window dressing by the institutional investors.

January effect in equal weighted portfolios was also evaluated. Positive January returns and return premiums were marked for the entire time period, even after the Tax Reforms in 1987. This indicated that institutional investors window dressed their returns by selling low performing small cap stocks before the year ends. This also provided evidence that the January anomaly is basically because of the small cap stocks.

It was evaluated from the Fama and French's three factors models that January returns have a positive and strong relationship with the firm size and book to market effects. Amongst the two effects, size effect dominated in explaining the January effect. However, a negative relationship has been witnessed with the momentum factor. Therefore, it can be concluded that the January effect is basically because of the small cap stocks.

The impact of Tax Reforms in 1987 on the January effect was looked upon separately as well. For value weighted returns alone the null hypothesis of no January effect could not be rejected however, for equally weighted returns, the null hypothesis of no January effect was rejected. Therefore, it can be deduced that in the later years now, January effect existed in an equal weighted portfolio only. The effect has diluted for value weighted portfolio.

Wong et al. (2006) also analyzed the January effect inherent in the Singaporean stock market<sup>2</sup>. Tests of January effect revealed that during the pre crisis period the average returns in January were higher than the average returns for the rest of the year, difference however not being very noticeable. Average daily returns for the Straits times index were negative for the entire time period under consideration, depicting a vanishing January effect in the later years.

Ariss et al. (2011) also inquired about the January anomaly in the Gulf Cooperation Council (GCC) indices<sup>3</sup>. A very interesting pattern of returns that was observed in the GCC indices was that instead of January, high, positive and significant returns were obtained in the month of December. These returns were also significantly higher than the returns on all the other months of the year. Therefore, it was concluded that GCC countries had a December effect instead of January effect as in other markets of the world.

#### **V. The Holiday Effect**

Chong et al. (2005) examined pre holiday effect across three important markets of the world i.e. U.S, U.K and Hong Kong, during the last three decades of the 20<sup>th</sup> century. Data on daily stock index returns was extracted from DataStream. S&P 500 index was used for US, FT 30 was used as a representative of the U.K market and Hang Seng index was used for the Hong Kong market. The time period under study was from 1973-2003.

The sample period was divided into two categories for each of the three markets: the trading days before a specific holiday (when the stock market was closed) and the trading days during the rest of the year. The descriptive statistics were then calculated for all the three indices under study. A t-statistic for the differences in the average of returns was also computed.

The results provided a strong evidence for the existence of the pre holiday effect in all the three indices, effect being most significant for U.K and Hong Kong indices. It was found that the average of the returns on the days specifically before a certain holiday was more than the average of the returns on other non pre holidays.

Another test was also conducted to analyze if this anomaly persists or has declined over the years in these three markets. Time series regression analysis was used for deriving results and a declining pre holiday effect was witnessed in the U.S market specifically in the 1990s. The decline was not that evident in the other two markets i.e. U.K and Hong Kong.

Al-Loughani (2005) investigated the presence and causes of holiday effect on stock returns in the Kuwait stock exchange (KSE). The general daily stock index published by the Global Investment House was the data used. The

<sup>2</sup> Data description has already been mentioned in the day of the week effect, where a part of this article has been discussed.

<sup>3</sup> This article discussed the day of the week effect and the January effect for GCC countries. The data description has already been given in the day of the week effect section.

time period under study was from 1984-2000. The holidays considered for the study were those that were declared by the government and that involved closure of the stock market.

The data was split into two sub periods which were: the pre invasion period which was from 1984-1990 and the post liberation time period which was from 1993-2000. Returns during the trading days right before any specific holiday and the rest of the trading days of the year during the two sub periods were compared. T-statistics, Mann-Whitney test and Kruskal Wallis test were conducted on the data to obtain results for analysis. It was apparent from the tests that there wasn't any noticeable difference between the two sub periods, thereby indicating that holiday effect does not exist in the KSE.

A further analysis using Kruskal Wallis test was also done to determine if there was any particular pattern of returns observed during the time surrounding the holidays and it was revealed that the returns on post holidays were higher than the returns on pre holidays or other trading days of the year. The reason quoted in the paper was that the investors engage in selling before the holidays and right after the holidays they develop their investment portfolios again.

Chen and Singal (2004) explored and tested different factors that might be responsible for January anomaly for small stocks. These factors included window dressing, bid ask bounce, information and tax loss selling.

The data set included common stocks traded on the NYSE, AMEX and NASDAQ indices. Daily returns on the stocks were obtained from the CRSP files. Data on closing bid ask prices was collected from the NYSE's trade and quote (TAQ) data base. The time period under investigation was from 1993 till 1997. Firms that have the return data for the whole year as well for the first five days of January in the following year and also have bid ask quotes from TAQ qualified to be included in the sample.

According to the results, the highest potential for tax loss selling (PTS) was witnessed in 1998. Tests for residual standard deviation revealed that it was 85% of the total standard deviation which indicated that systematic risk was a very small proportion of the total risk.

Market microstructure biases which included bid ask bounce, bid ask spreads and transaction costs are few causes of the January effect for small firms. The existence of these factors, in particular the bid ask bounce will make it impossible for investors to take the of arbitrage opportunities. It was evident from the tests that the January returns were 2.1% more than the December returns thereby, confirming the existence of January effect.

It was extracted from the results of PTS that five day January returns were higher than the five day December returns for high PTS quintiles and vice versa. This supported the existence of January effect as low returns for high PTS stock in December indicated that there was more selling of high PTS stocks and these stocks were bought back in January which resulted in returns being higher as compared to December returns. On the other hand stocks that were low PTS stocks were categorized as winner stocks which were held back and were sold in January. For these stocks December returns were more than the January returns.

Analysis of the size factor also supported the notion that small stock exhibited large returns in January when compared to December and the opposite was true for large stocks.

Another test was conducted on the basis of trading volume. The hypothesis created in this regard was that if tax loss selling was causing the January effect then the stock should experience high trading volume in December. However, if tax gain selling was driving the January effect then high trading volume should occur in January. The results exhibited were again consistent with the notion presented earlier.

Window dressing was another important factor responsible for January effect. It is when investors sell losers in December and hold back winners to be sold in January. It was hypothesized that low PTS stocks will have higher December returns and high PTS will have higher returns in January

The results obtained, did not support the presence of window dressing during this period thereby making it a year end phenomenon only.

Information available for different firms can also affect the returns yielded. It was hypothesized that firms with less information will tend to outperform and since small firms have less information, the January effect might occur because of small firms.

Wong et al. (2006) also analyzed the holiday effect in the Singapore stock market. During the pre crisis period it was observed that the pre holiday average returns were much higher as compared to the average returns on all the other trading days of the year for all the years in the era. Risk and return trade off however, was witnessed on pre holiday days. It was also seen that during the post crisis era, the difference between the average returns on pre holiday days and the rest of the days declined and became immaterial, again supporting the evidence that calendar anomalies are lost in Singapore market.

Singapore market is becoming more efficient and thus abnormal profits cannot be earned by the investors now as these calendar anomalies have been eliminated from the market.

Cao et al. (2009) examined the existence of pre holiday effect in New Zealand's market. These holidays were those on which the stock market was closed and trading did not take place. Different hypothesis were developed and tested for dissecting this anomaly. Pre holiday average returns were compared to the average returns on all the other

trading days of the year to see if this effect really existed. All holidays were looked upon separately as well to evaluate as to which holiday generated the highest returns on the day before it. Constancy of the anomaly during various time periods was examined to find out the time periods during which it had the greatest impact. Effect of international pre holiday anomaly on the New Zealand's stock returns was analyzed as well. Lastly, it was also investigated whether the firm size was one of the major contributors towards the pre holiday effect.

All firms on the NZSE40 and NZSE50 indices were looked upon for analyzing the difference in the mean returns on the pre holidays and all the other non pre holidays. The time period under analysis was from 1967 to 2006. In order to examine the relationship between a pre holiday effect and the firm size, all firms on the NZSE 10, NZX mid cap and the NZX small cap indices were taken into account. For testing the impact of international pre holiday effect on the New Zealand's pre holiday returns, the data was taken from S&P 500 index from the time period 1967 to 2003. To check on the constancy of the pre holiday effect, bid and ask prices of 20 large and 20 small NZ stocks were used.

It was discovered that the pre-holiday average returns were higher than the average returns on all the other trading days. It was also observed that the ratio of positive returns on pre-holidays was higher than the positive returns for all the other trading days, thereby rejecting the first null hypothesis that ratio of positive returns in the pre holidays and all the other trading days is the same.

To look at the impact of holidays individually, seven different holidays were included in the data set and those were Waitangi Day, Anzac Day, Easter, Queen's birthday, Labor Day, Christmas and New Year's day. The results were consistent with the analysis made so far that the pre holiday returns were much higher than the returns on all the other trading days. Highest average returns were observed on the trading day before Christmas while a trading day before Easter generated the second highest average returns. Lowest returns that were even less than the average returns on all the other trading days were obtained for Labor Day.

It was detected from the tests of constancy of the pre holiday effect that the pre holidays average returns were higher than the average returns on all the other days during all the seven periods considered.

In order to examine the effect of international pre holiday effect (US in particular) on New Zealand's pre holiday returns, NZSE40 index and S&P 500 index data for daily returns was selected for analysis. The results obtained from this study also directed towards the same point that pre holiday returns were higher than the returns on non pre holidays even after taking account for the delayed US returns. It was also concluded that US pre holiday effect did not have an influence on the pre holiday effect in New Zealand. Pre holiday effect in New Zealand has basically occurred because of the existence of some local factors.

Lastly the impact of firm size on the pre holiday returns was examined. It was observed from the regression analysis, that the small firms generated higher pre holiday returns as compared to the large firms.

It was hence concluded that pre holiday effect basically existed because of small firms.

## VII. DISCUSSION AND CONCLUSION

Calendar anomalies are among the most discussed issues in the financial literature. This is because these anomalies are the primary contributors towards the abnormalities in the stock returns. In this review paper, research studies about different stock markets have been reviewed to find evidence for the existence of these anomalies in those markets. In certain markets calendar anomalies have been faded out and don't exist anymore as is the case in Singapore stock market and Kuwait stock market.

Amongst all the anomalies reviewed in this literature survey, the weekend and the reverse weekend effect have been the most popular anomalies as a lot of articles have been written on these anomalies. Changing trading patterns of investors over the years have been incorporated in this effect. It was interesting to note that initially Friday returns were larger than the returns on any other day of the week, and even Monday represented negative returns. However, as the trading pattern changed and more institutional investors got involved in trading, Monday returns became positive and were even higher than the Friday returns.

There were several reasons that explained the January effect, most prominent being the size, window dressing and tax loss selling effects. It is likely that the January anomaly will also lose its effect over time. This is because as more and more investors become aware of the abnormal returns that can be earned at the beginning of the month, they will exploit this opportunity and hence, abnormal returns will be eliminated.

Turn of month effect exhibits larger returns on the last few days of the previous month and first few days of the next month. This anomaly tends to persist mainly for small stocks. Cash flows received by individual investors towards the end of the month are reinvested by them in early next month. Another important issue was huge cash outflows for institutional investors at the month end, which includes all the expenses that have to be paid off by the institutional investors at the end of the month. So it is likely that short term investments will be made by these investors that mature towards the month end and cash flows thus received can be used to pay off certain obligations that become due at the end of the month.



Different national holidays exist in a year that cause market closure and increase the non trading days in a year. Investors usually sell more before the holiday as they seem to avoid any new information that may release after the holiday; and they buy more after the holidays. This behavior increases the pre holiday returns more than the returns observed for the post holidays.

Overtime, some anomalies will completely vanish from the stock markets as markets become more and more efficient and trading requirements and procedures become more standardized. Disappearing effect has already been witnessed in some of the markets. Depending on the functioning of the individual stock markets, some calendar anomalies may continue to exist in some stock markets.

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