Calendar Anomalies in Stock Market: A Case of KSE 100 Index

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Abstract

This paper aims to investigate the calendar anomalies in Karachi Stock exchange by using KSE 100 index during the period of 2008 to 2012. The study examined the existence of week days, weekend and monthly seasonal anomalies. These calendar effects are examined by applying different statistical techniques. First of all series of daily and monthly returns were calculated. Then mean and standard deviation of daily and monthly returns were calculated. The values of mean and standard deviation have rejected the first two null hypothesis and accepted the third one. The results provide an evidence for the existence of calendar anomalies at KSE 100 index. The results showed that there is significant difference among the returns of days of the week, and Friday has highest mean average return which makes it confirm that weekend effect exists at KSE. Finally monthly anomaly in stock returns is also present because there is highest positive return in the month of March.

Keywords. Stock Market, Anomalies, weekday effect, weekend effect, monthly effect, Return.

1. Introduction

Stock market is defined as the market around all over the world that provides the means to buy and sell stock of different corporations (charles North, 2012). The performance of Stock market is usually affected by various factors including imperfect competition, market transparency, regularity actions, behavioral biasness and calendar effects. Presence of these factors in the stock markets leads towards inefficiency of market often referred to as Market Anomaly. According to (Sahar Nawaz, 2012) stock market anomaly is broadly defined as the irregular and unusual patterns of stock returns that exist within the stock markets. It means that prevalence of a situation when under given set of assumptions the actual returns are different from the expected returns. Market anomalies are very important to study because their existence in stock exchange enables the investors to make trading strategies to achieve abnormal profits. Market anomalies can be divided into three main categories as fundamental anomalies (including value effect), technical anomalies (including momentum effect) and calendar anomalies (including daily, weekly, monthly, yearly and holidays anomalies). Anomalies primarily contribute to abnormalities in stock return, so the focus of this paper is to examine the calendar anomalies including daily, weekly, and monthly anomalies at Karachi stock exchange using data of KSE 100 index from the period, 2008 to 2012.

1.1 Efficient Market Hypothesis (EMH)

According to Jensen, market is efficient (Information Efficiency) when there is no possibility of profit for someone by selling or purchasing of stock based on specific information (jensen, 1978). Modern portfolio theory states that in efficient market (perfect market) stock price changes randomly and it is impossible to someone to predict future price.A market anomaly (market inefficiency) is alteration in price and deviation in returns in the financial market which is usually seems to contradict with the Efficient Market Hypothesis. According to efficient market hypothesis the markets enormously and effectively reflect information about stock and stock markets and this information affect price very quickly, thus fundamental analysis (prediction on the basis of economic variables) and technical analysis (prediction on the basis of past performance of shares) would not be capable to help investors to achieve high returns. Efficient market hypothesis is very much associated with the random walk in theory according to which prediction about future development of stock is not possible because it is determined randomly. Fama introduce efficient market hypothesis, according to him the new information walks in the market randomly and affects the prices of stock directly. So any prediction about future price is impossible (Fama, 1970). But the recent studies on stock market anomalies and behavioral finance contradict with the efficient market hypothesis, as the researchers believe that the stock prices can be predictable to some extent. According to Anwar Halari (2013) calendar anomalies cast doubt on efficient market hypothesis, because the investors may be able to forecast the price changes in specific time periods including month, week and days as well. Similarly, "An important number of financial economists and statisticians started to believe that stock returns are characterized by seasonality and as a consequence they might be partially predictable. Moreover, a new breed of economists supported that stock price determination depends on psychological and behavioral

elements, something that make them to believe that future stock prices are somewhat predictable on the basis of past stock price patterns as well as certain "fundamental" valuation metrics (Drogalas, Athianos, & Elekidis., n.d)**."**

1.2 Individual Investor's Buying and selling decision

Individual buying and selling decisions are widely affected by information wondering in the market, individual values, experiences and investment strategies. Investors usually sell stock at price by making comparison with initial/original buy price in order to make some money (Shefrin, 1985). Investors sometimes sell the stock at price less than the original price because they usually expect that they are offering stock at a price higher than other seller's asking price (Genesove, 2001) and suffer loss. Investors basically make investment decision and sell stock that will help to increase capital gains. As for as the buying decisions are concerned (Odean, 1999) mentioned that the buying decisions are primarily based on prior winning and losing stock and also based on individual attention and interests. Buying decisions are based on individual attentions, high trading volume, high return and news announcements (Barber, 2000). Individual buying/selling activities and decision making cause change in stock price and expected returns.

1.3 Overview of KSE 100 index

An index basically provides investors the information about how the market is performing and comparison of stock prices over a period of time [1]. KSE 100 index was commenced on 1st November 1991. It is a capital weighted index and consists of 100 companies. It was recomposed by the baring securities London and rules were framed for its reconstruction on November 1994 [2].

1.4 Objectives

The study has the following main objectives;

- To examine existence of calendar anomalies in KSE100 index by using data from 2008 to 2012.
- To find the impact of calendar anomalies on stock returns.
- To find that which one among (Day of the week effect, Weekend effect, and January effect) have more impact on stock return.
- Finally try to find the patterns of stock market returns & future recommendations.

2. Literature review

Various researchers have worked on calendar anomalies in stock markets around the globe. This section provides the review of literature on (days of the week, weekend and January effect) anomalies relevant to this study. In order to have deeper understanding both pre and post 2000 research work on calendar anomalies were taken into account.

2.1 Days of the week effect

The days of the week effect means that the stock returns do not remain same throughout the days of week. This section provides pre and post 2000 work on the presence of days of the week effect in the stock markets.

Pre-2000 work.

Wide ranging evidences of day of the week effect have been documented by French (1980), Gibbons & Hess (1981), Keim & Stambaugh (1984), Smirlock & Starks (1986), and conclusion was that the mean return on Monday is negative and usually lowest while Friday has positive and normally highest mean returns in US stock market. The same was identified by Lakonishok & Smidt (1988), Abraham & Ikenberry (1994) and Wang et al (1997) in US stock market. Solnik identified positive returns on Monday, Wednesday, Thursday and Friday but negative return on Tuesday at Paris Bourse stock market (Solnik, 1990). Similarly, Westerfield (1985) examined the Australian, Canadian and Japan stock markets and found that there was lowest return for both in Japan and Australian markets on Tuesday.

Post- 2000 work.

According to Alrabadi & Qudah Anomalies indicate that the seasonal effects change the trend in price movement. They observed the anomalies in Amman stock market (ASM) over the period of 2002- 2011 and found that Monday has negative return in week days while the January has significant positive returns in years. (Alrabadi & AL-Qudah, 2012). Rodriguez identified from Latin America that Monday has lowest than expected return and Friday has highest positive return (Rodriguez, 2012). Kiymaz and Berument inquired the day of week effect with respect to trading activities of investors for this purpose prices from the indices of five countries Canada, Japan, Germany, US and UK have been taken from 1988 to 2003. They observed lowest return on Tuesday for Japan, on Wednesday for US, UK & Canada and on Friday for Germany. While highest return on Tuesday for US, on Wednesday for Japan, on Thursday for UK and Germany and on Friday for Canada (Kiymaz H. B., 2003). The similar study was conducted on existence of day of weak effect by taking data from five

countries of Asia (Malaysia, Singapore, Indonesia, Thailand and Philippines for the period 1992 to 2002. The results showed that Malaysia has negative return on Monday and positive return on Wednesday and Friday and the same in Thailand and Singapore. Indonesia has positive return on Friday while Philippine has positive return on Wednesday and Thursday (Chen, 2004). Brusa explored the weekday effect with reference to firm size and investment patterns by taking data from 1962-1988 of S&P 500 index. They concluded that Monday's return is not only weak but also lowest among the mean daily return of the week (Brusa, 2005). Joshi observed the trading patterns of investors in stock market by taking data from Nepal Stock Exchange from 1992-2005. Researcher concluded the positive highest return on Monday as compared to others days of week (Joshi, 2006). Marcelo found a significantly higher Friday return, by analyzing both open and close values for the index (BVL30) they considered that this higher return appears during the non-trading overnight period between Thursday and Friday. (M. M. J., 2000).

2.2 Weekend effect

Weekend effect means that the weekend (Friday) has highest positive return in the stock exchange. Various studies provide the evidences of weekend effect in the stock markets. This segment presents the pre and post 2000 research work on weekend effect.

Pre-2000 work

About weekend effect, the oldest evidence was provided by cross (1973) and French (1980) in US stock markets. According to their findings weekend (Friday) usually has highest positive return and start of the week (Monday) has negative return. Theories suggested that negative return on Monday is due to some bad news announcement during weekends. Damodaran (1989) "concludes that earnings and dividend announcements on Fridays are much more likely to contain reports of declines and to be associated with negative abnormal returns than those on other weekdays." Lakonisho & Maberly provided evidence that trading of investors either individual or institutional is affected by weekends (Lakonishok & Maberly, 1990). As for as the trading activities of the investors are concerned the information processing hypothesis claims that the individual investors after their weekend financial planning and analysis could be more active in selling (M., 1962), but the institutional investors may be less active as they make planning and do analysis on Monday (Kamara, 1997). The blue Monday hypothesis contributes the same by stating that investors are less optimistic on Monday so they are less willing to buy and more willing to sell the stock (Benson, 1989). This willingness to buy and sell the stock, cause change in price of stock and affect the returns by the start or at the end of the week.

Post-2000 work

The weekend effect has been the most popular anomaly in stock market (Sahar Nawaz, 2012). Many recent studies demonstrating the weekend effect. James P. & Craig A. (2011) reviewed the pre 2003 work on weekend effect and found fairly positive return on Friday in the previous empirical studies. Marrett & Worthington (2009) identified positive weekend return in Australian stock markets from 1996 to 2006. Boudreaux et al. (2010) investigated the weekend effect in S&P 500, NASDAQ and DJIA indices for the period of 1976 to 2002. They broken their sample into bear and non bear market periods and found positive weekend effect only in non-bear market period. While in bear market period greater weekend returns persist only in the NASDAQ index. Basher & Sadorsky (2004) examined stock return in 21 countries over 1992 to 2004 they found negative Monday and positive weekend effect. But only in four countries: Turkey, Thailand, Taiwan, and Malaysia they found positive Monday effect (start of the week effect). Similarly it is not necessary that the stock exchanges give highest positive return at weekend. There may be highest positive return at the start of the week (Monday). Tong (2000) identified the negative weekend effect in twenty three equity market (cited in Joshi, 2004). Demirer & Karan (2002) investigated stock markets of Turkey and identified that today's return significantly affect the tomorrow's return. They could not found weekend effect and discovered start of the week effect where Monday's return indicates the returns of entire week. Raj & Kumari (2006) found significant positive return on Monday in Bombay Stock Exchange and National Stock Exchange and could not found weekend effect. Coutts & Sheikh (2002) examined Johannesburg stock exchange (JSE) of South Africa. By using daily index return they found no evidence for weekend effect at JSE. Iryna O. D., William S. & Robert A. (2010) found no weekend effect in Ukrainian stock and bonds markers. Keef & Roush (2005) examined the S&P 500 index over the period of 1930 to 1999, the results showed the absence of weekend effect. Similarly no evidence of positive weekend effect was identified in American depository receipts over the period of 1998 to 2004 (Bouges et al., 2009).

2.4 January effect

January effect means that the returns in January are significantly higher than other months of the year. This section offers relevant literature (pre & post 2000) on the stock returns in January and other months of the year.

Pre-2000 work

January effect was first documented by (Rozeff, 1976). The same was observed in another study, January returns are considerably significant and highly positive than other months of the year (S, 1986). Because Investment

decisions more likely tend to be made in January so there is a buying pressure during this month (J., 1990). This trend of purchasing is because; Mostly companies release much important information about them in the month of January (Rozeff, 1976). Therefore increase in buying trends in the month of January causes increase in price of shares and high positive Returns. Gultekin & Gultekin studied in seventeen countries and concluded that the January effect is significantly positive than other months (Gultekin, 1983). The same was contributed by (Wong & Ho, 1986) for the period of 1975 to 1984 in Singapore market.

Post-2000 work

Wong et al. analyzed the inherited January effect in Singapore stock exchange. They observed that the returns in January were higher than the rest of the months of year. (Wong et al., 2006). But it is not necessarily important for all stock exchanges to give higher return in the month of January. A very weak evidence of January effect was investigated by Tonchev & Kim (2004) in Czech Republic, Slovakia, and Slovenia. From Gulf Cooperation Council indices high positive significant returns was obtained in the month of December rather than in January (Ariss et al., 2011). Giovanis examined fifty five stock markets and observed no significant January effect in more than seven stock markets and he observed significant positive return in December among most of the countries (Giovanis, 2009). Al- Saad & Moosa (2005) investigated the Kuwait stock market, by applying the time series model; they could not derive January or December effect. In fact they found July effect at Kuwait stock exchange. Rufus Ayodeji (2009) examined the monthly seasonal effect in Nigerian stock Exchange (NSE) by using daily return data from 2004 to 2009. The results showed that there is no January effect but researcher found July and August effect in NSE. Bepari & Mollik (2009) examined seasonal effect in the return series of Dhaka Stock Exchange (DSE) of Bangladesh. The results revealed the highest mean return in April.

3. Data Description and Methodology

Wide range of stock market or calendar anomalies exist, ranges from day of the week effect (Andreas, G., 2011), weekend effect (William C. & Robert A., 2013), the half month effect, and January effect or month of the year effect, (Andreas, G., 2011), turn of the month effect (William S. & Don T., 2006), finally to Holiday & ex-post holiday anomalies (Armand P., 2006). But in the present study, due to time limits and other constraints to researchers, only week of the day, weekend and monthly anomalies were taken into account to investigate. For the purpose to identify the returns patterns and existence of anomalies at KSE, the data have been taken from KSE 100 index for the period from January 2008 to December 2012 [3]. Data was comprised of daily, weekly and monthly prices. Simple return was calculated by using following formula.

$Ri = (Pt - Pt - 1) / Pt - 1$

The above formula was used to calculate the daily and monthly returns where Ri is the return on specific day, Pt is the price of index on that specific day, while Pt – 1 is the price on the day Pt – 1. Then mean and standard deviation of the daily and monthly return were calculated (by using SPSS v.21) to find the difference in return over days and months. In order to test calendar anomalies at Karachi stock exchange, in KSE 100 index the study intends to test the following null hypothesis.

 1Ho= There is no difference in the day wise returns of KSE 100 index.
2Ho= There is no weekend effect in returns of KSE 100 index.
3Ho= There is no January effect at KSE 100 index.

4. Results and Discussion

The table 1 shows the day wise return of KSE 100 index from the period of 2008 to 2012. The table shows that there is clear and significant difference in returns of days of the week. Monday, Wednesday and Thursday returns are negative while Tuesday and Friday have positive returns. So 1Ho is rejected because the table 1 provides clear evidence about the difference in average returns of days of week. Moreover, Monday has lowest while Friday has highest mean average return (.00115) and low standard deviation. It means Karachi stock exchange has provided highest return on Friday in the last five years. These findings are consistent with the study of (Rodriguez, 2012), the researcher identified that the Monday has lowest and Friday has highest positive return in Latin American stock markets. So 2Ho is also rejected because the table 1 also shows that weekend effect exists in Karachi stock exchange which is cleared from mean average return of Friday. The same results regarding positive weekend effect was identified by (Marrett and Worthington. 2009) in Australian stock markets from 1996 to 2006. So it is clear from the table 1 that the days of the week and weekend anomalies exist in Karachi stock exchange as there is a clear difference in mean daily returns.

Table 1: Day wise return of KSE 100 index from Jan. 2008 to Dec 2012.

	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
Monday	247	.0971704	-.0450752	.0520952	-.5108150	-.002068077	.0131189555	.000
Tuesday	248	.0951192	-.0422146	.0529046	.1712469	.000690512	.0123362353	.000
Wednesday	251	.0981714	-.0492887	.0488827	-.0868761	-.000346120	.0127679795	.000
Thursday	250	.0902992	-.0432181	.0470811	-.2444212	-.000977685	.0106736791	.000
Friday	242	.0807372	-.0415385	.0391987	.2782556	.001149817	.0117388391	.000

Table 2 shows the monthly average return for five years. Usually indices show highest return either at the start or by the end of the year. Wong et al (2006) identified highest positive return in the month of January, and highest positive return in December was identified by Giovanis (2009). But KSE 100 index showed highest mean average return in March (0.074670) and very low average return in the month of May. The effect of highest return in March is similar to the study of (M. Dharani, 2011), the researcher found high return in March at S&P CNX Nifty Shariah Index and S&P CNX Nifty Index. These variations in the returns of all the months show that monthly anomalies exist in KSE. But there is no January effect prevails in KSE, as there is highest positive return in the month of March. So the 3Ho is accepted which states that there is no January effect at KSE 100 index.

Table 2: Monthly return of KSE 100 index from Jan. 2008 to Dec 2012.

	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance
January	5	.1125516	-.0653102	.0472414	.0689246	.013784929	.0452652899	.002
February	5	.1687873	-.0861122	.0826752	.1301141	.026022826	.0698273318	.005
March	5	.1864214	.0107808	.1972022	.3733510	.074670195	.0717103753	.005
April	5	.0420692	.0005439	.0426131	.1018697	.020373938	.0149408833	.000
May	5	.2086906	-.2012475	.0074430	-.3115250	-.062304992	.0900330573	.008
June	5	.0618825	-.0174177	.0444648	.0734609	.014692178	.0244716885	.001
July	5	.2134104	-.1334034	.0800070	.0526492	.010529849	.0910408414	.008
August	5	.2424605	-.1228675	.1195930	-.0996289	-.019925772	.1031023231	.011
September	5	.0730651	-.0030615	.0700036	.1541792	.030835833	.0335316063	.001
October	5	.0821496	-.0235926	.0585570	.0747873	.014957453	.0310075669	.001
November	5	.0872725	-.0302434	.0570290	.0711047	.014220936	.0348771477	.001
December	5	.4302004	-.3616038	.0685966	-.2638910	-.052778196	.1753292025	.031

5. Conclusion

There is limited research work has yet been done on the calendar anomalies in KSE 100 index. This research paper will be a contribution towards calendar anomalies by exploring the patterns of stock market returns. In this study series of returns of KSE 100 index are calculated for all the days of the week and months of the year from 2008 to 2012. We found a clear difference in mean daily and monthly return patterns, like negative return on Monday, Wednesday & Thursday and in the month of May, August & December. We could not found Monday effect and January/December effect in the KSE 100 index. In fact highest positive return on Friday, positive weekend effect and significant positive return in the month of March are found in this study. It means that the calendar anomalies exist in KSE 100 index and these anomalies cause changes in price of stock and return. The results of this study are very useful to investors at KSE because the patterns of returns can be helpful for investors to make selling, buying and hold decisions to make favorable profits. However in this study, due to short span of time only five years data (in Gregorian calendar) have been collected. So we recommend the researcher to further study calendar anomalies by taking extended data and by considering Gregorian as well as Islamic calendar.

Notes

[1].*http://www.investopedia.com/terms/m/marketindex.asp*
[2].*www.**kse**.com.pk*
[3].http://finance.yahoo.com/q/hp?s=^KSE+Historical+Prices

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Mean Daily (Fig. 1) and Monthly (Fig.2) Return of KSE 100 index from Jan. 2008 to Dec 2012.
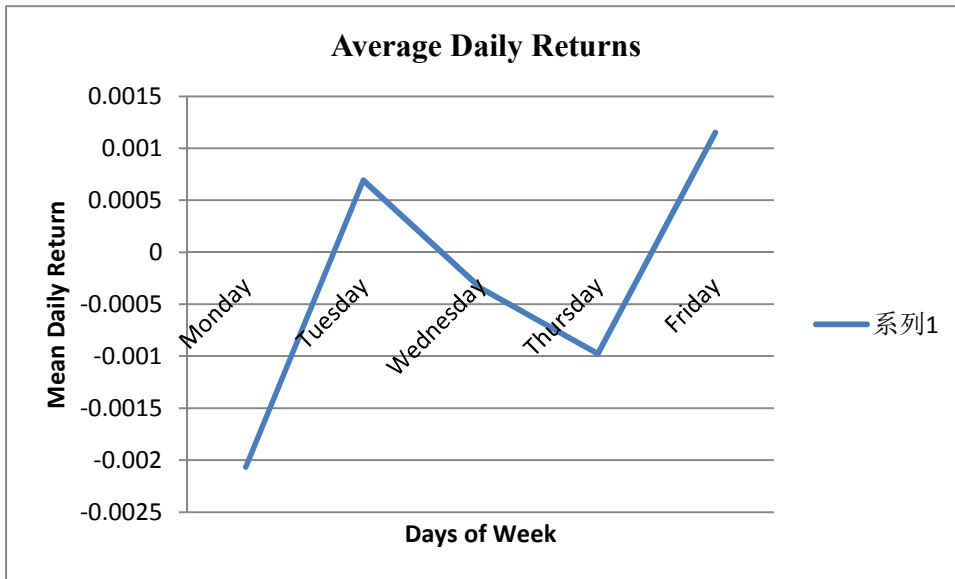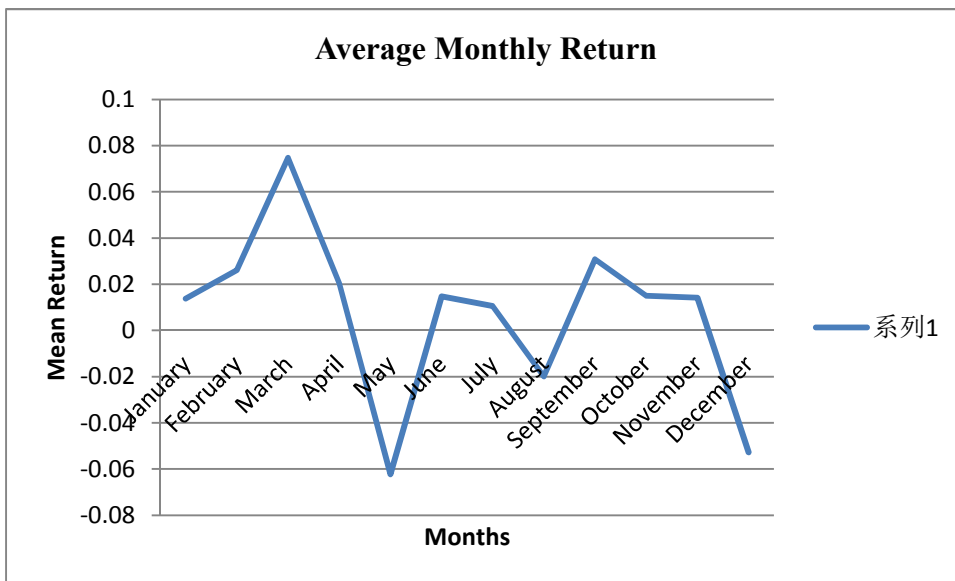
Figure 1.

Figure 2.

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