Islamic Calendar Anomalies: A Study of Ramadan Effect on Pakistan Stock Exchange

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Abstract

Religion plays a very significant role in the lives, decision making and behavior of the peoples. Ramadan is the most important month of Islamic calendar. The Muslims in this Holy month increase their emphasis on Religious activities such as recitation of Quran, Praying, Fasting and giving charity to capture the wealth of blessings which are promised in this month, and try to avoid wrongdoings and sins such as gambling and speculation. This study examines the effect of Ramadan on Pakistan Stock Market. Daily data of PSX-100 index for period ranging from 1st January 2007 to 31st December 2016 was used. Time series regression was used to test the presence of Ramadan effect. The result revealed a positive significant Ramadan effect. Furthermore, it was observed that the returns are higher during the last ten days of Ramadan as compare to the first ten days of Ramadan and on 27th day of Ramadan the returns are the highest. The outcome of this study can be used by the investors to formulate better strategies to generate excess returns considering presence of monthly effects.

Keywords: Ramadan Effect, Efficient Market Hypothesis, PSX-100 Index, Seasonality, Pakistan Stock Market

Introduction

The concept of Efficient Market Hypothesis (EMH) was expressed for the first time by Louis Bechelier in 1900 in his dissertation, "The Theory of Speculation". He investigated the prices of commodity and stocks to find out if they fluctuate randomly. His work despite of great importance was being ignored until the 1950s. Fama (1965) published his dissertation about the EMH. Fama (1970)published a review of both the evidence and Theory for the Hypothesis. He came up with the EMH which states that the stock prices show all the available information, and no one can beat the market continuously. The paper also stated EMH in

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three forms along with their definitions, Strong form, semi strong and weak form efficiency. After the development of EMH by Fama in 1970, the EMH was practically tested by the Capital Asset Pricing Model (CAPM). The result showed that there are a lot of deviations from the theoretical approach of EMH. The investors exploit these deviations and by making simple strategies, beating the market and earn abnormal profits. Presence of these deviations show inefficiency of the market and these deviations were named as anomalies (Ullah, Ullah, & Usman, 2010). The presence of anomalies violates the EMH and anomalies have been found in the world's financial markets making a window for generating huge abnormal return or abnormal profit on stocks which is raising a question on the efficient market hypothesis. According to Frankfurter and McGoun (2002)anomalies indicates the irregularities or deviation from the routine or normal order. Anomalies mean the difference between the actual and the expected results. Anomalies are strange myth and hard to predict as they can appear, disappear and reappear (Schwert, 2003).

Market efficiency anomalies work as a gauge or a yard stick to measure the market efficiency. To test the market efficiency, one should test the presence of market efficiency anomalies. The more the market is efficient in all aspects, the more it is credible and reliable for investors although investors are in a continuous hunt for some irregularity or some pattern like the market efficiency anomalies for higher returns or abnormal profit (Ahsan & Sarkar, 2013).

Anomalies not only occur in the stock market, but they also happen in other markets. Wilson and Jones (1990) documented existence of anomalies in bonds and commercial paper using data of 131 years. There are several studies which proves that stock market anomalies happen to occur in almost all capital markets of the world.

Calendar Anomaly means irregularities that totally rely on some event or time of the calendar that leads to abnormal profit (Karz, 2010). There are different types of calendar anomalies like turn of the month effect, day of the week effect, Halloween effect and Ramadan effect. Ramadan effect is Islamic calendar anomaly while the others are Gregorian calendars anomalies. There are different societies and countries in the world that follow their own calendar which are based on their religion. For example, christen people follow Gregorian calendar, Jewish people follow Hebrew calendar, the Chinese and Hindu follow their own calendar and Muslim People follow the Islamic calendar. Islamic calendar is based on a lunar also called Hijri calendar. There are twelve months in Islamic calendar; each Islamic month starts when a new moon appears. A lunar month contain only 29.53 days at the average

that's why the year of Islamic calendar is eleven days (approximately) shorter than the year of Gregorian calendar (Mustafa, 2008). Many researchers investigated the Gregorian calendars anomalies while few of them investigated the Islamic calendar anomalies(Al-Hajieh, Redhead, & Rodgers, 2011; Al-Ississ, 2015; Almudhaf, 2012; Ramezani, Pouraghajan, & Mardani, 2013). Ramadan effect is the most important anomaly in the Islamic calendar anomalies.

Ramadan Effect
Religious belief plays a very significant role in the lives, decision making and behavior of the people. Weber (1930)stated that there is a significant effect of religious beliefs and practice on economic development. Ramadan is an important Islamic month; this is the 9th month of Hijri calendar, in this Holy month the Quran was revealed to the Holy Prophet Muhammad (PBUH). As The Holy Quran mentions *"The month of Ramadan is that in which the Quran was revealed, guidance to men and clear proofs of the guidance and the distinction; therefore, whoever of you is present in the month, he shall fast therein..."* (2:185).

Fasting is compulsory for all the Muslims during this Holy month, fasting is one of the important pillar in the five pillars of Islam. Muslims don't drink or eat anything during the fast from dawn until sunset. The Muslims in this Holy month increase their emphasis on the recitation of Quran, Praying and giving charity to capture the wealth of blessings which are promised in this month. Muslims in this month avoid wrongdoing and sin such as gambling and speculation. Working hours of the offices and business activities are also reduced in Pakistan.

The month of Ramadan consist of three parts, which are different from each other as each part has its own characteristics and rewards. The intensity of worship is also different in each part. The following Hadith documented that *"The first part of Ramadan brings God's Mercy, the middle of which brings God's forgiveness and the last part of which brings release from hell fire."* (Ibn Khuzaymah, 3: 191)

The 1st part is from 1st day of Ramadan till 10th day, the 2nd part is from 11th day of Ramadan till 20th day and the 3rd part is from 21st day of Ramadan till the 30th day or till the end of Ramadan. In the last 3rd part of Ramadan Muslim increases their worship because this part is supposed the most blessed part of Ramadan. In the Islamic calendar, the holiest night is Laylat Al-Qadar which is present in the last 10 days of this month. This argument is clear from the following Hadith *"Search for the Night of Destiny in the odd nights of the last ten days of Ramadan"* (Bukhari, 3(32): 234).

In the night of Laylat Al-Qadr, the Quran was revealed to the Holly Prophet Muhammad (PBUH). While it is not clear that the Laylat Al-Qadar falls on which night of the last ten days of Ramadan, The Muslim scholars believe that Laylat Al-Qadar falls on 21st, 23rd, 25th, 27th or 29th night of Ramadan, while most of the mare believing that the "Night of Destiny" fall at the evening of 27[th]of Ramadan. This night shows the peak of religious activities, Muslims spend this night in mosques in recitation of Quran and in the prayer until the break of dawn. Most of the Radio and television channels in Pakistan live broadcast the recitation of Holy Quran from the Grand Mosque in Mecca.

Many studies have been conducted around the globe to investigate Ramadan effect (Akrami, Garkaz, & Mehrazin, 2012; Oğuzsoy & Güven, 2004; Ramezani et al., 2013; Rehomme & Rejeb, 2008; Seyyed, Abraham, & Al-Hajji, 2005). These studies confirm that the Ramadan effect exist around the world capital markets. The use of Ramadan effect is well suited to investigate the relationship between the religious activities and stock returns for several reasons. First, the days of Ramadan are broadly observed by large number of population in the country under investigation based on culture and religious. Additionally, in the Holydays of Ramadan the Stock markets remain open unlike the other Holy days. Second, The Secular and Christian Months follow Solar Gregorian calendar while the Islamic Months follow a lunar calendar. The year of Islamic calendar is 11 days shorter than the year of Gregorian calendar. This means that on the Gregorian calendar the days and months of Islamic calendar shifts each year. In Pakistan, most of the businesses follow a Gregorian calendar rather than Islamic, which enable us to separate the impact of faith from the established fiscal calendar anomalies. Third, the studies show that in the whole month of Ramadan the strength of worship is not the same and based on religious importance of each day, the intensity of worship goes up and down. Additionally, in Ramadan the strength of worship is different in the last 5 even and odd days that separate the effect of religious activities from non-religious aspects of Ramadan. Eid Al-Fitr festival starts at the end of Ramadan, Muslim celebrate two main festivals annually and Eid Al-Fitr is one of them. The festival of Eid Al-fitr is linked with increased consumer spending same as the Christian in Western countries increase their shopping during Christmas. If the effect of stock market is due to religious experience, then the magnitude of this effect of Ramadan will be different in the last five even and odd Ramadan days. But if this effect is due to the greater commercial activities in the expectation of Eid_Al-Fitr then the effect will be equal across all the even and odd days of last part of Ramadan (Al-Ississ, 2015). Fourth, In Pakistan only two studies

have been conducted to find out the Ramadan effect (Husain, 1998; Mustafa, 2008). However, both studies have few limitations. (i) both studies gave contradictory results about the Ramadan (ii) neither find out the effect on mean returns (iii) these studies didn't check the effect of different days and parts of Ramadan in Pakistan stock exchange as each day of Ramadan has its own value, and the intensity of Worship depends on the religious importance of each day which affects Trading activities in Ramadan (Al-Ississ, 2015).

Therefore, the present study intends to fill these gaps and investigate Ramadan effect in Pakistan Stock exchange. The present study added to the extant literature by considering the effect of different days and parts of Ramadan on stock prices.

Literature Review
Different studies have been conducted around the globe on Ramadan effect anomaly on stock prices. Many of these studies have found significant effect of Ramadan on stock prices. For example, Oğuzsoy and Güven (2004)investigated the Ramadan effect on stock market of Istanbul from 1988 to 1999 using the data of Istanbul stock exchange (ISE) 100 and 30 index, and found that in the month of Ramadan there is a significant increase in the mean return during the period. Similarly,Alper and Aruoba (2004) studied the effect of Ramadan for Turkey stock market; they used the data of turkey stock exchange 100-indexand concluded that there is a positive Ramadan effect in Turkey. Following the same lines Seyyed et al. (2005) investigated the Ramadan effect for Saudi stock market, Rehomme and Rejeb (2008)studied the Ramadan effect in Tunisian stock Market, while (Akrami & Garkaz); Akrami et al. (2012); Ramezani et al. (2013)investigated the Ramadan effect in Tehran stock market. These studies confirmed that Ramadan effect exists in the markets under consideration.

On the other hand, few studies have studied the same phenomenon using evidence from multiple countries. For example, Białkowski, Etebari, and Wisniewski (2012) studied the effect of Ramadan in 14 Muslim countries from 1989 to 2007. In their study they investigated that whether Ramadan affected the behavior of stock market prices. In this study, they selected the Muslim majority countries. Their results suggested that the mean return during Ramadan was greater than the other months of the year. They found that during the month of Ramadan the share prices significantly decreased in all the sample countries except from Turkey. The authors stated that investors can outperform by selling the share at the end of Ramadan and buying shares

before the start of Ramadan in Muslim countries. They observed that by this strategy the transaction costs would be less as compare to the return.

Similarly, Abadir and Spierdijk (2005)tested Ramadan effect for two countries in the Far-East and four Muslim countries in the Middle-East. They examined the Ramadan effect for these countries stock markets and found that the effect of Ramadan exists. Based on their results the index returns are negative before Ramadan and become strong positive after Ramadan as the investor liquidate their investment before Ramadan and re invest after Ramadan. They concluded that in Muslim countries the Ramadan influences trading volumes and equity returns. A similar study was conducted by Almudhaf (2012)who investigated the Ramadan effect in the 12 Muslim majority counties. The author found that the Ramadan effect is present and found a high return in 5 countries. One reason, that's why the stock returns are different at different period in Muslim countries, is that the economic activities fluctuate in the Islamic months of the year based on the religious belief of Muslim society. Researchers have documented that the economic activities of a county are affected by the religious beliefs of the people(Al-Ississ, 2015; Almudhaf, 2012; Białkowski, Gottschalk, & Wisniewski, 2008). These studies found significant effect on the anomalies under consideration on stock prices in all countries.

The study conducted by Al-Ississ (2010)found somewhat different results. He examined the effect of Ashura and Ramadan for 17 Islamic countries' stock markets for 20 years from 1988 to 2008. His Study found that in all Muslim countries there is positive return in stock markets during the month of Ramadan and found that the Ashura had negative effect on stock returns while the Ramadan had a positive return.

On the other hand, few studies have reported insignificant effect of Ramadan on stock prices. Bley and Saad (2010)studied the effect of Ramadan across the Gulf Cooperation by using both the market index and company vise stock prices. They found that in all the Gulf Cooperation countries the expectation of the Muslim festival Eid Al-Fitr, generated significant positive returns except from the smallest market of Bahrain. The authors didn't find any significant effect on return at the beginning of Ramadan. Similarly, (Al-Hajieh et al., 2011)studied the effect of Ramadan in the stock markets of Middle Eastern countries during the period 1992 to 2007. They found that in four stock markets of Middle Eastern countries during Ramadan the mean returns were greater than the yearly mean returns but in Bahrain and Saudi Arabia stock market the returns were not higher.

Husain (1998)studied the effect of Ramadan on Pakistani stock market. He used daily share prices of 36 companies from 8 sectors over a

period of 1989-1993 and applied GARCH Model and found that there is no Ramadan effect and demonstrated that volatility is significantly lower during the Month of Ramadan. Mustafa (2008) investigated the Ramadan effect, he used data of daily share prices of KSE-100 index over a period of 1998-2004 and applied Regression Analysis, he found an after-Ramadan effect and reported that during the month of Ramadan Karachi stock exchange is low risky market.

Methodology
Data
This study used daily data of PSX-100 index that were collected from Pakistan stock exchange website and yahoo finance. The sample period used for this study is ranging from 1st January 2007 to 31st December 2016.

Calculating Monthly Returns
Returns of PSX-100 index calculated as the natural log of the today's Index value divide by Previous Day's Index value.

$$R_t = ln\frac{P_t}{P_{t-1}}$$

Where Rt=Daily returns of PSX-100 index,
Ln=Natural log
Pt =Index closing value at time_t
Pt-1=Index closing value at time_t-1

Analytical Techniques
This study estimated the effect of Ramadan on stock market through running a time series regression after checking stationarity problem through Augmented Dicky Fuller (ADF) test. According toSaunders (1993), this study included variables of lagged return to account for non-synchronous trading effects (Akgiray, 1989), and dummies for month of the year and day of the week to control for seasonal and calendar anomalies.
The following regression is used to find the Ramadan effect on daily returns:

$$R_t = \beta_0 + \beta_1 R_{t-1} + \beta_2 R_{t-2} + \beta_3 \text{Holyday}_t + \beta_4 \sum_{i=2}^{6} D_i + \beta_5 \sum_{j=2}^{12} M_j + \varepsilon ....(1)$$

Where
Rt=the Mean Stock Market return on day t
Holyday t =is a dummy variable that take the value 1 if the day t is Ramadan day and take value 0 if the day t is other than Ramadan day
Rt-1=one-day lagged return of stock exchange index
Rt-2 =two-day lagged return of stock exchange index
Di = day of the week dummy variable with Tuesday omitted

Mj = month of the year dummy variable with April omitted

The study also used the following regression to find the effect on trading volume

$$Vol_t = \beta_0 + \beta_1 Vol_{t-1} + \beta_2 Vol_{t-2} + \beta_3 Holyday_t + \beta_4 \sum_{i=2}^{6} D_i + \beta_5 \sum_{j=2}^{12} M_j + \varepsilon \ ....(2)$$

Where

Volt = the percentage change in trading-volume on day t

This study examined the Ramadan-effect of seven Holidays as previously explained in different sections of the study:

Ramadan t = a dummy variable that take value 1 if day t is the part of the Ramadan Month and 0 otherwise

Ramadan1_10t = a dummy variable that take value 1 if day t falls on the day from 1st to 10th of Ramadan and 0 otherwise

Ramadan11_20t = a dummy variable that take value 1 if day t falls on the day from 11th to 20th of Ramadan and 0 otherwise

Ramadan21_30t = a dummy variable that take value 1 if day t falls on the day from 21st to 30th of Ramadan and 0 otherwise

Odd Days t = a dummy variable takes the value 1 if day t be the 21st, 23rd, 25th, 27th, or 29th day of Ramadan and 0 otherwise

Even Days t = a dummy variable that take value 1 if day tbe the 22nd, 24th, 26th, 28th, or 30th day of Ramadan and 0 otherwise

Ramadan_27th t= a dummy variable that take value 1 if day t be the 27th day of Ramadan and 0 otherwise"

The main challenge in the study was to convert the Hijri calendar dates to the equivalent dates of Gregorian calendar to find out the exact Gregorian dates for the Islamic Holydays for the period under investigation. In general, the countries don't keep the official records of the previous Islamic months. So, to find the equivalent Hijri/Gregorian date is a challenging and labor-intensive work. The study used the archive of official newspapers to find out the exact Gregorian dates of Ramadan in Pakistan. The Detail of Ramadan starting and ending days and dates according to Gregorian calendar are shown in Table 1.

Table1. Detail of Ramadan for Ten Years (Jan 2007 to Dec 2016)

Year	Start of Ramadan		End of Ramadan		27th Ramadan
	Day	Date	Day	Date	
2007	Thursday	13/9/2007	Friday	12/10/2007	9/10/2007
2008	Monday	2/9/2008	Tuesday	30/09/2008	28/9/2008
2009	Saturday	22/8/2009	Sunday	20/9/2009	17/9/2009
2010	Wednesday	11/8/2010	Thursday	9/9/2010	6/9/2010
2011	Monday	1/8/2011	Monday	29/08/2011	27/8/2011
2012	Friday	20/7/2012	Saturday	18/8/2012	15/8/2012
2013	Tuesday	9/7/2013	Wednesday	7/8/2013	4/8/2013
2014	Sunday	29/06/2014	Monday	28/07/2014	25/7/2014
2015	Thursday	18/06/2015	Thursday	16/7/2015	14/7/2015
2016	Tuesday	7/6/2016	Tuesday	5/7/2016	4/7/2016

Results

Table 2 shows the statistics of ADF test for the sample period. The corresponding probability values are significant at 5% level and the absolute value of t-statistics is greater than the critical values at all levels. This result shows that the data is stationary at level which is desirable.

Table 2 Augmented Dicky Fuller test for unit root

Variables	ADF Test Value	Critical Value	Critical Value	Critical Value	Significance
	(At level)	1%	5%	10%	
Return	-43.27	-3.43	-2.86	-2.57	0.000
Volume	-56.183	-3.43	-2.86	-2.57	0.000

Figure 1 shows the mean daily returns in Ramadan and other days in Pakistan Stock Market. The mean and their descriptive statistics are listed in Table2 consistent with our predictions that returns in Ramadan is different from other days
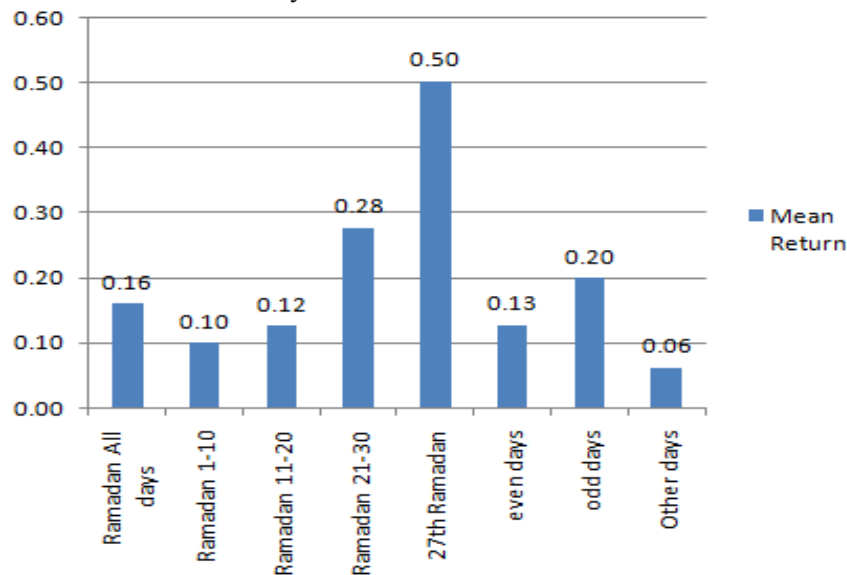

Figure 1. Mean Returns during the month of Ramadan and Other days

Mean returns during the month of Ramadan (0.16%) different from the mean returns in other days (0.06%). Mean return during the last ten days of Ramadan is 0.28%higher than the first ten days (0. 10%).The Mean return on 27th Ramadan is 0.50% higher than all days of Ramadan and other days. During the odd days of Ramadan, the mean return is 0.20%, greater than the even days return (0.13%). These results are consistent with the results of Al-Ississ (2015) found in his study that mean return

during Ramadan is higher than other days, last five odd day of Ramadan have higher return than last five even days while 27th day of Ramadan has the highest return than all other days.

Table 2 Mean daily return during the month of Ramadan and other days

	Obs	Mean	Std. Dev.	Min	Max	ttest
Ramadan All	128	0.16	1.02	-4.06	3.07	1.18 (0.23)
Ramadan 1_10	73	0.10	1.16	-4.06	2.74	0.30 (0.76)
Ramadan11_20	69	0.12	0.96	-2.26	2.94	0.48 (0.79)
Ramadan 21-30	57	0.28	0.90	-1.71	3.07	1.39 (0.16)
27th Ramadan	5	0.50	0.42	-0.14	0.94	0.84 (0.40)
even days	98	0.13	0.13	-2.96	2.68	0.57 (0.56)
Odd Days	102	0.20	1.08	-4.06	3.07	1.19 (0.23)
Other Days	2221	0.06	1.19	-6.92	8.25	

Table 3 (available at Annex A) shows the regression results on Ramadan day for market-returns controlling for lagged returns, month of the year and day of the week. There is 0.14% increase in daily-returns in the Holy month of Ramadan (Model 1), and this result is statistically significant at 10% level of significance, this is consistent with (Al-Ississ, 2015) found that Ramadan effect exist in Stock Exchange. The result shows that in the third part of Ramadan there is 0.26% increase in daily returns (Model 2)which is higher than the return during the other two parts and statistically significant at 10 percent, this result is consistent with Al-Ississ (2015)found that last part of Ramadan has high return than the other parts of Ramadan. While Ramadan first and second parts are associated with 0.0089% and 0.091% respectively and statistically insignificant.

    In odd days of Ramadan, the daily returns are associated with 0.19% increase in return and statistically significant at 5-percent level (Model 3), while returns in the Ramadan's even days are not statistically significant (Model 3). This confirms that the Odd-Days effect is a result of religious experience, not non-faith aspects of the end of Ramadan, such as increased consumer spending (Al-Ississ, 2015). The daily return on 27th Ramadan is associated with 0.28% increase in return and statistically significant, this is consistent with the result of Al-Ississ

(2015) who found in his study that the return on 27th Ramadan is higher than all other days. The results of the study are in conflict with the findings of (Husain, 1998; Mustafa, 2008, 2011). Husain (1998)found that the stock return in Pakistan's market did not change during Ramadan. Similarly, Mustafa (2008, 2011) found an "after-Ramadan" effect and stated that there is no effect of Ramadan in the Pakistan Stock market, but our results are consistent with the findings of (Akrami et al., 2012; Al-Ississ, 2015; Białkowski et al., 2012; Ramezani et al., 2013; Rehomme & Rejeb, 2008; Seyyed et al., 2005), that confirmed that Ramadan effect exist in the markets under consideration and 27th Ramadan is associated with a higher return than all the other days.

Ramadan is an important Islamic month. The Muslims in this Holy month increase their emphasis on worship, but the intensity of worship is different in each day of this month and goes up and down based on the religious importance of each day. As the intensity of worship is different in different days of Ramadan same as according to our results the return in different days is different. The intensity of worship is high in last ten days of Ramadan, especially on odd days and culminates on 27th day of Ramadan. The return during last ten days is greater than first and second ten days while the return in odd days is greater than even days and on 27th day of Ramadan the return is the highest as compare to all other days. Figure 2 explains the mean change in trading volume during Ramadan and other days in Pakistan Stock Market.
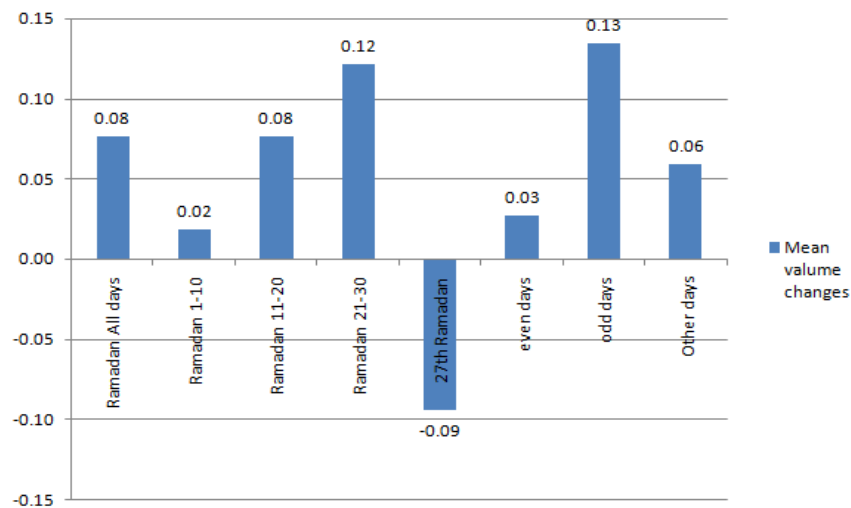

Figure 2 Mean Changes in Volume during Ramadan and other days

Table 4 Mean Changes in Volume during Ramadan and Other Days

	Obs.	Mean	Std. Dev.	Min	Max	t test
Ramadan days	128	0.76	0.08	-0.71	3.57	0.40 (0.68)
Ramadan 1_10	45	0.02	0.45	-0.10	11.5	-0.64 (0.52)
Ramadan11_20	46	0.08	0.40	-0.60	1.49	0.26 (0.79)
Ramadan 21-30	39	0.12	0.80	-0.54	3.58	0.85 (0.39)
27th Ramadan	3	-0.09	0.19	-0.31	0.06	-0.62 (0.53)
Even Days	61	0.03	0.42	-0.71	1.48	-0.58 (0.56)
Odd Days	67	0.13	0.66	-0.60	3.57	1.35 (0.17)
Other Days	1593	0.06	0.43	-0.10	3.04	

Table 4 shows the means and their descriptive statistics. Table 4 and Figure 2 report that the mean changes in trading volume in Ramadan days is (0.08%) higher than in other days (0.06%). Mean changes in trading volume in first ten days of Ramadan is 0.02% while in 2nd and 3rd ten days are 0.08% and 0.12% respectively. On 27th Ramadan mean changes in trading volume is negative (-0.09%), while odd day has 0.13% change as compare to even days 0.03%. In this study, few results are contradicted with the results of (Al-Ississ, 2015), he found that in the month of Ramadan the mean change in volume traded is lower than other days and 27th day of Ramadan has the highest mean changes in volume but our study shows higher mean changes in volume during Ramadan than other days and 27th day of Ramadan has negative changes. Mean changes in volume traded on Ramadan's five last Odd days is greater than the even days which is consistent with the findings of (Al-Ississ, 2015).

Table 5 (Available at Annex B) shows the results of regression for the change in trading volume in Ramadan. The month of Ramadan is associated with1.35% drop in the daily volume changes (Model 1) which is statistically insignificant and consistent with findings of (Al-Ississ, 2015). The change in traded volume during Ramadan's first ten days is dropped by 6.1% and in second ten days the traded volume is dropped by1.5%, while in third ten days of Ramadan the change in traded volume is 4.7% which are statistically insignificant (Model 2), this result is consistent with (Al-Ississ, 2015). The change in traded volume during the last five even days of Ramadan is 5.6% which is lower than the other days (Model 3), while changes in traded volume during the Ramadan's last five odd days are associated by 2.6% change and statistically

insignificant (Model 3). Finally, the change in traded volume on 27th Ramadan is associated by 3.6% (Model 4). All these results are consistent with the results of (Al-Ississ, 2015).

Conclusion and Recommendations
The study finds that religious activities during the month of Ramadan are associated with the change in mean returns. The mean return is greater during the Holy month of Ramadan than the mean return in all other days of the year. The study also investigated the mean changes in different parts of Ramadan. The mean return during the last ten days of Ramadan is higher as compare to the first ten days of Ramadan. In the Islamic calendar, the holiest night is Laylat Al-Qadar which is present in the last 10 days of this month. Most of the Muslim scholars believe that this nightfall on of 27th Ramadan. This night shows the peak of religious activities in the Islamic year. The result shows a highest return on this holiest day as compare to the return on other days. Our study also found that the return during the Ramadan's five last odd days is greater than last five even days. This shows that the effect is due to religious activities and not due to the other non-religious aspects of Ramadan. The return in last ten days of Ramadan is different from each other due to religious significance of each day of the last part of Ramadan.

As anomalies have influential effect, therefore, investor should consider their effect for making investment decisions and to formulate better strategies to generate excess returns. Based on the results, it is also recommended that investors should invest in stock during the month of Ramadan because they will earn a positive return greater than the return on other days, especially on 27th Ramadan. This study would also like to suggest researchers to carry out similar studies in Pakistan Stock Market to improve the authenticity of anomalies in the stock market of Pakistan by considering other Islamic calendar anomalies like Eid-ul-fitar effect, Eid-ul-Adha effect, Hajj effect, Muharram/Ashora effect and Rabi ul awal effect.

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Annex A

Table3 Results of Ramadan effect on market returns

Variables	Model 1			Model 2			Model 3			Model 4		
Return	Coeff.	Robust Std error	t-values	Coeff.	Robust Std error	t-values	Coeff.	Robust Std error	t-values	Coeff.	Robust Std error	t-values
Ramadan all	0.143	0.088	1.64*									
Ramadan 1-10				0.090	0.143	0.63						
Ramadan 11-20				0.091	0.126	0.72						
Ramadan 21-30				0.269	0.139	1.94*						
Even days							0.090	0.111	0.81			
Odd days							0.193	0.115	1.69*			
27th Ramadan										0.282	0.195	1.45*
Return t-1	15.267	3.440	4.44***	15.284	3.449	4.43***	15.297	3.442	4.44***	15.321	3.442	4.45***
Return t-2	5.598	3.116	1.8*	5.599	3.118	1.8*	5.572	3.118	1.79*	5.665	3.118	1.82*
Constant	0.268	0.093	2.9***	0.268	0.093	2.9***	0.268	0.093	2.9***	0.267	0.093	2.9***
Control Variables	Yes			Yes			Yes			Yes		
	Number of obs = 2453			Number of obs = 2453			Number of obs = 2453			Number of obs = 2453		
	F (18, 2434) = 3.98			F(21, 2431) = 3.62			F(19, 2433) = 3.79			F (18, 2434) = 4.04		
	Prob > F =0.0000			Prob > F = 0.0000			Prob > F = 0.0000			Prob > F = 0.0000		
	R-squared = 0.0491			R-squared = 0.0495			R-squared = 0.0493			R-squared = 0.0483		
Heteroscadasticity Test	chi2(1) = 197.08			chi2(1) = 197.28			ch i2(1) = 196.31			chi2(1) = 192.23		
	Prob > chi2 = 0.0000			Prob > chi2 = 0.0000			Prob > chi2 = 0.0000			Prob > chi2 = 0.0000		

Note: Daily returns are in percentage form (multiplied by 100). There are four Models 1-4 and each model has 3 columns, Model 1 is for Ramadan as a whole, Model 2 is for 3 parts of Ramadan, Model 4 is 27th day of Ramadan and Model 4 is for even and odd days of Ramadan. Figures in column 1 of each model are for coefficient, Figures in column 2 of each model are Newey and West (1987) heteroscadasticity-autocorrelation-consistent standard errors. Tuesday and April are dropped. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels respectively.

Annex B

Table 5 Results for change in trading volume during Ramadan

Variables	Model 1			Model 2			Model 3			Model 4		
Volume	Coeff.	Robust Std error	t-values	Coeff.	Robust Std error	t-values	Coeff.	Robust Std error	t-values	Coeff.	Robust Std error	t-values
Ramadan all	-1.351	3.443	-0.39									
Ramadan 1-10				-6.037	4.607	-1.31						
Ramadan 11-20				-1.465	4.259	-0.34						
Ramadan 21-30				4.668	8.377	0.56						
Even days							-5.593	3.894	-1.44			
Odd days							2.630	5.244	0.500			
27th Ramadan										3.606	8.996	0.400
Volume t-1	-25.269	2.766	0.027*	-25.409	2.793	-9.1***	-25.248	2.755	-9.17***	-25.302	2.768	-9.14***
Volume t-2	-5.547	2.699	-2.06**	-5.689	2.726	-2.09**	-5.543	2.693	-2.06**	-5.535	2.701	-2.05**
Constant	8.475	2.332	3.63***	8.477	2.331	3.64***	8.453	2.331	3.63***	8.465	2.333	3.63***
Control Variables	Yes			Yes			Yes			Yes		
	Number of obs = 2453			Number of obs = 2453			Number of obs = 2453			Number of obs = 2453		
	F (18, 2434) = 8.32			F (20, 2432) = 7.60			F (19, 2433) = 7.91			F (18, 2434) = 8.22		
	Prob > F = 0.0000			Prob > F = 0.0000			Prob > F = 0.0000			Prob > F = 0.0000		
	R-squared = 0.0852			R-squared = 0.0863			R-squared = 0.0862			R-squared = 0.0851		
Heteroscadasticity Test	chi2(1) = 256.41			chi2(1) = 277.97			chi2(1) = 271.40			chi2(1) = 262.18		
	Prob > chi2 = 0.0000			Prob > chi2 = 0.0000			Prob > chi2 = 0.0000			Prob > chi2 = 0.0000		

Note: Volume Changes are in percentage form (multiplied by 100). There are four Models 1-4, Model 1 is for Ramadan as a whole, Model 2 is for 3parts of Ramadan, Model 4 is for 27th day of Ramadan and Model 4 is for even and odd days of Ramadan. Figures in column 1 of each model are for coefficient, Figures in column 2 of each model are Newey and West (1987) heteroscadasticity-autocorrelation-consistent standard errors. Tuesday and April are dropped. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels respectively.