LAMIC CALENDER EVENTS AND STOCK MARKET REACTION: EVIDENCE FROM PAKISTAN

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ABSTRACT: *This study investigates stock market anomaly in Pakistani stock market using its major stock index i.e. Karachi Stock Exchange 100-Index (KSE-100 Index). Previous literature of calendar anomalies mostly based on the Gregorian calendar such as weekend effect, month effect, time of the month effect and holidays effect. However, Islamic calendar anomalies are rarely investigated in the literature of finance. To explore this issue, this study has examined the impact of five Islamic calendar events namely Ramadhan, Eid-ul-Fitr, Eid-ul-Adha, Ashora, and Eid Miladun Nabi on Pakistani stock market index returns using daily data of KSE-100 Index for the period of 2001 to 2012. Ordinary least square (OLS) is used to investigate the Islamic calendar month effect while event methodology is used to explore the significant abnormal return in the period of the Islamic calendar events. Data are obtained from yahoo finance and KSE website. ADF-test is used to check the stationary of data. As Islamic calendar events' dates moves over time with respect to Gregorian calendar, so dates of these selected Islamic calendar events are confirmed by daily news papers. Result of the study reveals that the Islamic events have a significant impact on the stock return in studied period except the event of Eid ul Azha. There are observed significant abnormal returns in pre-period event window of Ramadan, Ashora, Rabiul Awal and Eidul Fitar. And the post event window for Ramadan and Eidul Fitar has significant abnormal returns. On the basis of these results we conclude that Islamic calendar anomaly exist in Pakistani stock market. The results exhibits that Muharram and Ramadan have a significant positive effect on KSE-100 Index's returns*

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1.   INTRODUCTION

In present time research, a great deal piece of evidence has accumulated on return irregularity (Anomaly) in equity markets. Opposing to previous traditional finance philosophy that return distribution should be equal across total working days of the week, month and year but there are empirical evidences for the calendar anomalies. This philosophy of traditional finance means that there should be no difference in the returns of the financial instruments due time in which these returns are observed. It was established that financial instrument's returns affected by any particular time period such as Holidays effect, weekend effect and Islamic Calendar effects. These phenomena referred as anomaly in finance literature.

Anomalies indicate the situation when financial security/s (individually or group) are priced beside the efficient market philosophy. According to market efficiency theory, price of financial asset reflects all available relevant information regarding asset. Calendar anomaly or irregularity refers to the propensity of stock returns to exhibit orderly pattern at define time of the day, month or year [1]. Iqbal et al. [2] explain the irregularity called as anomaly, as the constant unpredictable and irregular behaviour of the financial instrument (stock) returns which can't be endorsed to rational financial theories.

Irregularity and outliers in the price or the rate of return consistently observed in the financial market can't be explained under the Market Efficiency Theory given by [3]. Under this theory, it is assumed that financial markets are informational efficient. In turn, one could not make unanticipated abnormal returns on the regular bases by considering the risk adjustments under the given information available at the time when investment is made. One of the basic assumptions of the Efficient Market Hypothesis (EMH) is the rational behaviour which explicate that average population is correct and whenever new information comes open to market participant, they adjusts their anticipation related to share's price according to information [3].

Information which influences the rational behaviour of the economic agent may be arrived from both economical and non economical news, surprises or events. Economical information and surprises are monetary policy announcement by central bank of any state, profit distribution announcement etc. Non-economic sources for any information or news are holiday effect, sports event, religious event, etc. Non-economic events can be categorized into social event, religious event and cultural event. Non-economic factors like emotional factors for example mood (happiness or sadness) strongly ffects the human opinion and human deeds which in result influence the human choice selection process. Non

conventional finance (behavioural finance) also exposed a number of significance empirical evidence for the effect of behavioural factors influencing on financial assets' prices such as [4] investigated the impact of football matches results on stock market behaviour, [5] analyzed the weather effect on stock market returns and explored the mega sports events effect on stock market performance.

Theory about market efficiency given by [6] states that in efficient financial market, equity instrument's return follows a random walk. Random walk theory explains that returns of financial assets are identically independently distributed across time. Price is a function of return which is expected in future time period by investor. This expectation about returns related to financial security is affected by information which comes to know by any news or surprises. As any information associated to stock which is traded in the market, price of that equity is adjusted accordingly by investors and financial market participants. These surprises and news are reached to economy by any event which could be economic or non-economic.

Research on the relationship between Islamic calendar events and Pakistani stock market return is particularly helpful for a number of reasons. First these events are observed and experienced as religious and spiritual events by a vast part of the population in Pakistan. So these will helpful to investigate the factual pattern of financial market participants in Pakistani stock market. Second, like non-muslim religious holidays based on their specific calendar, Islamic calendar events pursue lunar based calendar named as Hijri calendar while the Gregorian calendar is an official calendar in Pakistan. There are about ten to eleven days are less in Hijri calendar as compared Gregorian calendar year. It states that Islamic calendar event appears on the same day of Hijri calendar year but with respect to our official calendar, these selected Islamic calendar events shift days and month every year on the economic year of Pakistan. So this study is helpful to examine the presence the Islamic calendar anomaly in Pakistan.

There are number of studies investigating the relationship between financial market and events (economical and noneconomic) [7, 8]. But to the best of our knowledge, there is not even one study which is covering all these following selected Islamic events impact on stock market returns in Pakistan. The current study will analyze effects of Hijri calendar events/festivals based on lunar cycle on Pakistani stock market.

The current study is an effort to answer the questions such as whether Islamic calendar months (Muharrm to Zil-haj) significantly affect the Pakistani stock market returns? whether Pakistani stock market shows the significant abnormal return in the pre- and post- period of Islamic calendar events such as Eid ul Fitr and Adha, Ashora, 12th Rabiul Awwal and Ramadhan?

Keeping in view the above questions, objective in this study is to explore the empirical significant evidence for the impact of selected Islamic calendar effect on Pakistani stock market returns. For the investigation of the Islamic calendar effect, two approaches are used: Event study and Regression analysis. In event methdology, effect of five Islamic calendar events namely the month of Ramadan, Eidain (Fitr and

Adha), Ashora and Eid Miladun Nabi on the Pakistani stock market returns are examined. Furthermore, regression analysis is used to analyze, the Islamic calendar month effect on stock market returns.

Events put an impact by both way economically and psychologically which in turn affect the behaviour of economic agent in an economy. Behavioural phenomena with respect to market efficiency theory plays important role in different field of finance: portfolio theory, asset pricing, corporate finance, and the pricing of options.

This paper is expected to give a source for the expert and general financial market participant who may be attracted in result that how the particular time on the basis of some non-economic events permit them to reach abnormal return. Reality of Hijri calendar unpredictability in Pakistan stock market gives evidence for Islamic calendar effects, market participant can break the market returns patterns and has a chance to beat the market and this is in opposition to the primary theory of market efficiency that no one has the chance to make returns above the average return of the market.

Evidence for the Presences of Islamic calendar anomaly will be helpful for the market participant in term of their anticipations of the prices of share. This phenomenon supports them to bang (beat) the equity market. Furthermore, Pakistani largest financial instrument (equity) market is a slim market where small number of investors holds key chunks of the stock market. They can not only manage but also can smash the financial instrument market by subsequent the arbitrage plan in short period of time in the case of any calendar anomaly in Pakistan. Though, in the longer period, the arbitrage plan could not be the efficient policy [9]. Remaining part of paper is arranged in a way that section 2 contains the literature review of the studies on Islamic Calendar anomalies, section 3 explains the research methodology. Results and their discussion is presented in section 4and section 5 concludes the study.

2. LITERATURE REVIEW

Most of work done by researchers in the literature of finance is based on Gregorian calendar. There are two ways to determine the time period. One is based on lunar system and other is based on solar system. Hijri calendar (Muslim calendar) is lunar based calendar. Hijri calendar is eleven days shorter that Gregorian calendar. Hijri calendar is used as an official calendar in some countries such as Saudi Arabia but most of Muslim countries used Gregorian calendar as a fiscal calendar including Pakistan [10]. The following segment contains the studies related to the calendar anomalies based on non-Hijri calendar observed in financial markets including Pakistan.

There are studies related to Islamic calendar events in different states. Ramadan effect is studied by [11] in Muslim countries including Pakistan found positive effect, [12] in Turkey and [13] in Tehran.. These studies show a positive effect of Ramadan. Eid ul Fitr effect are observed by [14] in Malaysia, Singapore, and [15] in Turkey. Eid ul Adha effect are observed by [12] in Turkey, [16]. They exhibited no effect of Eid ul Adha. [12] investigated the seasonality effect due to moving holidays in the economic in of turkey. They used three certain holidays namely Ramadan, Eid ul fitr, Eid

ul Adha and found a significant effect of these moving holidays on the financial market index. Similarly, [16] examined the calendar anomaly in the Palestine stock market by emphasizing on the holiday effect including Eid ul Fitr, Eid ul Adha and, Islamic New Year holiday. Results of the study indicate that there is a not significant effect of holidays on the stock prices but experienced that in pre-holiday period, financial instrument's prices are little bit higher as compared to the post-holidays periods. In another study, [17] empirically examined the effect of the month of Muharram and Safar in Tehran financial market. Results revealed that there is a significance difference in the prices of equity in the pre and post period of selected month in the selected period. [13] also analyzed the relationship between stock's abnormal returns and the holy month of Ramadan in Tehran's financial market. Findings of the study revealed that there was a significant abnormal returns experienced in the Ramadan period and pre and post-Ramadan period. Ramezani et al. [18] also investigated the Islamic calendar effect in Tehran financial market using daily observations for the period from 2002 to 2012. Results of this study revealed that there was significant positive relationship between the holy month of Ramadan and stock returns in selected market.

In the context of Pakistan, there are number of studies for Islamic calendar month effect with emphasize of the Ramadan effect such as [19, 20 , 21 , 22 , 2]. Significant negative returns are observed in the pre period of Islamic Holidays by scholars. In the month of Muharram, negative returns are experienced studied by [10].

[21] empirically investigated the Islamic month effect on the stock market behaviour. For this given purpose, fourteen Muslim countries including Pakistan are examined using event study methodology. Results revealed that there are nine time higher stock returns observed in month of Ramadan as compare to rest of the Islamic year months. Furthermore, less volatility was experienced in the pattern of equity returns. It is concluded that there is a significant positive effect of the Ramadan on the stock returns. [22] examined the evidence against market efficeiny in Pakisatn equity market. Ramadan effect is investigated for this purpose. They found no significant evidence of Ramadan effect on the mean returns. While on the other side of the picture, there was a strong significant evidence for the decline in the volatility of stock return in KSE during the period of the Ramadan. They explained that this low variability in financial asset prices may be due to slow pace of economic activities in Pakistan economy in this month. [2] also empirically analyzed the Islamic month effect on Karachi Stock Exchange stock returns. Results of the study exhibited that there is a significant positive effect on the KSE-100 index. This shows that there is a significant Ramadan effect in Pakistani equity market. In another study, [10] empirically studied the Islamic calendar effect on Pakistani financial market. The results of the study explained that there is a significant Ramadan effect on Pakistani stock market and negative significant effect of Muharram month on stock returns.

Two types of calendars are used on the basis of time calculation in different state and societies such solar system based calendar and lunar system based. In this study Islamic calendar based on a lunar calendar named as the Hijri calendar is used. In Islamic calendar, there are events which Muslim society observers and celebrates at large level. These are a Holy month like Ramdhan and days like Aashoora and Eid-ul-Fitar and Eid-ul-Azha and birthday of Muhammed (SAW).

In the literature, there is less work on Islamic calendar anomaly even to the best of my knowledge; there is no study which covers all these five Islamic calendar events namely Ramadan, Ashora, Eid-ul Fitr, Eid-ul-Adha and Eid-Miladun Nabi to investigate the impact of these events on stock market return in Pakistan using event study. We are going to try to add some empirical contribution by investigating the Islamic calendar anomaly in Pakistani financial market.

3.   RESEARCH METHODOLOGY

The purpose of the study is to analyze the impact of Islamic calendar events on stock market returns in Pakistan. In order to investigate the presence of Islamic calendar anomalies, five Islamic calendar events are selected in the study. These events include Ashora , Eid Miladun Nabi , Ramadan , Eidul Fitar and Eidul Azha. In order to investigate the presence of Hijri calendar anomalies, daily KSE-100 Index covering the duration of era from January 2001 to December 2012 is used. It covers almost 12 years' daily data of KSE-100 Index. KSE-100 Index is used because this index truly characterizes performance and the behaviours of overall stock market. The data of KSE-100 Index values are taken from website of yahoo finance and official data base of the Karachi Stock Exchange (KSE) available at website of KSE.

In this study, there is only one economic variable that is stock index return. The daily data for Karachi Stock Exchange are applied. Daily returns are determined by means of this given formula used [9] and [22]:

$$R(t) = Ln\left(\frac{P(t)}{P(t-1)}\right) * 100 . \qquad .... (1)$$

Where R(t) is KSE-100 index's return at time (t). This return is measured by taking natural Log of ratio between KSE-100 Index at time t-1 (P (t-1)) and KSE-100 Index at time t (Pt). We are applying two methods in this study namely regression and event methodology. In regression analysis, Islamic calendar months from Muharram to Zil-Haj by the help of dummy variables are used as Independent variable. In the event study, following five Islamic calendar events are analyzed. These events include the Holy Month of Ramadan, Ashora, Eid-ul-Fitr, Eid-ul-Adha and 12th Rabi-ul-Awwal.

Islamic Calendar events observed in this study are divided into two categories. One is Islamic Calendar Holidays events: Eidain (Fitr and Adha), Ashora and Birth date of Last Prophet (S.A.W) and second one is Islamic Calendar non-holidays event: Ramadan. Hijri Calendar based on lunar cycle are initially transformed to dates of Gregorian calendar based on solar system by means of every day's news paper and other reliable sources such as official Hijri calendar and then analyzed the statistical effect of events.

In our study, two methods are used to investigate the Islamic calendar anomaly. One is regression method and second one is event study method. In regression method, we will follow the methodologies used by [1]. In order to check out the presence of Islamic calendar anomalies, daily closing KSE-

100 Index's returns are calculated. KSE-100 indexes are studied because KSE-100 index accurately covers routine and the behaviours of on the whole Pakistani equity market and Hijri calendar irregularity and anomalies are without much difficulty traced out in KSE-100 indexes relative to individual firms stock's returns.

The ordinary least squares (OLS) method is used. We set dummy variable for every Islamic calendar month, the value 1 is for the corresponding month, and 0 is otherwise. Returns are regressed on total Islamic calendar months: Muharram, Safar, Rabiul Awwal, Rabiul Sani, Jamidi Ula, Jamadi Ussani, Rajab, Sha'ban, Ramadan, Shawwal, Dhil-Q'ada, Dhil-Hijja. The residual series generated by regression model is supposed to be autonomous and not dependently dispersed with a zero mean and stable variation as assumed by [10]. The following model is proposed for analysis as used by [1] and [23]:

$$R(t) = b1 * D1(t) + b2 * D2(t) + b3 * D3(t) + \cdots + b12 * D12(t) + b13 * R(t-1) + e(t) \ldots\ldots\ldots (2)$$

Where in equation (2), Rt is return on the day 't', D1t is dummy variable capturing the month effect in $\beta1$ for first Islamic month, D2t is for the second Islamic Month, D3t is for third Islamic Month, D4t is for fourth Islamic Month and so on, D12t is for twelfth Islamic Month, R(t-1) is for random walk and εt is Error term understood as white noise.

Before the estimating of regression model, it is prerequisite to test out unit root in data series. There are many formal tests to examine stationary in data series such as dickey fuller test, PP test. In our study Dickey Fuller test is used to analysis for data stationary.

Augmented Dickey-Fuller (ADF) test is applied to check whether the data which shows time series properties, hold stationary characteristics or not. If the time series is founded non-stationary data and regression analysis is applied, then the result will be not reliable. For this purpose ADF test will be applied.

It is a basic condition for conclude any decision in a time series data by applying OLS method. Stationary data series have three basic properties in which mean variance and co-variance are constant over time and constant mean. It suggests that its mean and variances is not affected by time. To test the stationary properties in data series, we have used ADF test. ADF test is applied to examine that whether data time series has stationary properties or not.

ADF test is customized description of Dickey Fuller model for examine data stationary property. ADF test is better to DF test as it take paramedic alteration in innovative DF analysis for upper direct of association by imagine that given data series chase AR (P) procedure. ADF analysis method takes into account upper order connection by accumulation differences of lagged expressions of the dependent variable to the right hand side of the test.

A time series data have a stationary property when it shows the following three properties. One is constant means over all time period and, second one is constant variance of variable over all time period and third one is constant covariance. The testing method for the ADF test is as follow:

$$\Delta Y(t) = \alpha + \gamma Y(t-i) + \varphi \Delta Y(t-i) + \varepsilon(t)\ldots\ldots\ldots\ldots\ldots(3)$$

Where in equation, α is intercept which is constant, $\Delta y(t)$ is presenting a change in time series variable at time (t), Y (t-i)

is lagged series of Y (t-i) with coefficient γ and φ is indicating the coefficient of $\Delta Y(t-i)$, $\varepsilon(t)$ is residual series supposed to be a random walk series. If alpha (γ) is equal to 1, it means there is a unit root problem in data series. Then regression analysis cannot be applied. It α is less than one, it means data series is stationary. $\Delta Y(t)$ means the difference between Y (t) and Y (t-i).

Second method, an event methodology is used to examine the significant abnormal return in the period of Islamic calendar events such as Eidain (Fitr and Adha), Ashora and Eid Miladun Nabi day and the Holy month of Ramadan on stock market return. Using this methodology, we examine prices and returns over time. In an event study, we desire to work out the nonstandard routine connected with an incident.

To estimate the non-normal returns, we require a statistical economic model for capturing the normal returns behaviour i.e. expected return. Expected returns are estimated to determine the abnormal return to establish event window. Abnormal return is considered by taking the distinction between actual and estimated normal behaviour of returns. The event window is created on the bases of date of event occurred (event day). Two windows are created. One is estimation window to determine the normal behaviour of returns and other is event window to examine the stock's behaviour. For the estimation of normal returns, Auot-Regressive Moving-Average procedure is used.

After estimating the expected return, the event window is created to determine the effect of the Islamic selected non-economic events on the stock market returns using abnormal returns. To analyze the overall effect in event window, the cumulative abnormal return is measured. We have calculated the CAR for each day ranging from (Day -5) to (Day +5). To assess the CAR, each irregular return at time t is added to the preceding all days abnormal return in event window.

$$CAR(t) = \sum T(ARt) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4)$$

To examine the significant impact, t-statistic is applied. Empirically significant positive nonstandard KSE-100 Index's return shows nonstandard stock returns and observing significant non-positive returns presents nonstandard loss. To estimate t-statistic value, SPSS application is applied.

For the estimation of the normal return behaviour, univariate analysis is used. Univariate analysis named by ARIMA (p,d,q) was first popularized by [24], and ARIMA models are often referred to as Box-Jenkins models. There are three stages discussed by [24]: identification, estimation and forecast. In identification stage unit root analysis is applied which is primary condition of the ARIMA (p,d,q) analysis and autocorrelation and partial autocorrelation is determined. For unit root analysis we applied ADF test and for autocorrelation we used correlogram application. An important source of information in detecting the presence and form of serial correlation is the correlogram. Qualitative examination of the correlogram is an important diagnostic tool but it does not constitute a formal statistical test. The use of this function was introduced as part of the [24] approach to time series modelling, where by plotting the partial autocorrelative functions one could determine the appropriate lags p in an AR (p) model or in an extended ARIMA (p,d,q) model. In estimation stage, parameters of the model is specified. Lag orders are determined for AR(p) and MA (q).

Table 4.4: Abnormal Return's (AR) window

	Ashora		Rabi ul Awwal		Ramdan		Eid ul Fitr		Eid ul Adha	
	Mean	sig. level	Mean	sig. level	Mean	sig. level	Mean	sig. level	Mean	sig. level
pre5	-0.37	0.30	0.11	0.81	-0.69	0.07	-0.31	0.20	-0.54	0.27
pre4	-0.17	0.49	-0.81	0.34	-0.44	0.26	-0.17	0.47	0.12	0.74
pre3	0.27	0.34	-1.2***	0.01	-0.47	0.38	0.88***	0.01	0.17	0.39
pre2	0.59**	0.05	-0.07	0.87	0.88**	0.02	0.58**	0.05	0.13	0.44
pre1	0.75**	0.05	1.30	0.12	0.27	0.32	0.78**	0.02	0.29	0.33
Event	0.00	0.00	0.00	0.00	0.10	0.21	0.00	0.00	0.00	0.00
post1	0.00	0.99	0.03	0.95	1.22**	0.02	1.22**	0.02	0.48	0.27
post2	0.24	0.44	0.37	0.40	-0.09	0.76	-0.09	0.76	0.13	0.77
post3	0.11	0.78	0.10	0.72	-0.96	0.14	-0.96	0.14	-0.51	0.19
post4	0.59*	0.09	0.19	0.77	0.05	0.72	0.05	0.72	-0.65	0.20
post5	-0.04	0.94	-0.09	0.68	-0.43	0.34	-0.43	0.34	-0.96*	0.09

*** Significance level of 1%, ** significance level of 5%, * significance level of 10%

ARMA model is generalization of simple Auto-Regressive (AR) model. In this statistical model two tools are applied for capturing the serial association in the residual term. In this method, first part is auto regressive (AR). Each AR model match to the use of lagged value of the residual in the forecast equation. Second is moving average term. This forecasting model uses lagged values of the forecast error to improve the current prediction. When a variable is explained by its own lagged values then ARMA model is applied for capturing normal behaviour to estimate the expected returns. This model is applied to predict the expected return of time series return data.

Auto regressive part associated to ARMA model which explain that current observation of the variable is explain by lagged values. For that purpose auto regressive model will be applied. Second part linked to model explains that current values of data can be estimated by error term observation which indicates shook that are un-traceable behaviour in data series of the variable. The model of ARMA is:

$X(t) = \alpha + \gamma 1 X(t-i) + \beta \varepsilon(t-i) + \mu t$ ....(5)

Where in equation (5) γi, β are slopes, α is intercept and μ is residual term which should be white noise. Xt is a time series variable and Xt-1 is lagged. Residual term series (εt) and ε (t-1) residual lagged term series which is estimated by model.

A model which includes the influence of time path of independent variables and/or error term on the time path of dependent variable is called lagged effect. It is a type of dynamic model. In which the lagged term effect of dependent variable is captured.

$X(t) = \alpha + \gamma i X(t-i) + \varepsilon t$ .... (6)

Where γi, α, and ε are model coefficients namely parameters, constant and residual term which should be white noise. X (t) is a time series variable and X (t-1) is lagged. It suggest that a variable can be explain by its own lagged term which denote that present observation of data series of variable is predicted by statistically examined the past behaviour of given data series of the variable.

It is a statistical approach to form uni-variate time series analysis. The MA (q) notation explain the moving average model of order q. In this part of the ARMA model, we are trying to cover that how much current observation of the time series data is explained by its own error terms and lagged of error term which means that current observation of the data series can be predicted by error term observation.

$X(t) = \alpha + \gamma i \varepsilon t + \beta \varepsilon t\text{-}1 + \mu t$ .... (7)

Where γi, β, α, and μ are model coefficients namely slopes (γi, β), constant (α) and residual term (μ) which should be white noise. Xt is a time series variable and εt is residual series and εt-1is lagged term. This error term generated by regressing, the time series variable on its own lagged series.

It suggest that a variable can be explained by its own error term and error term lagged which denote that present observation of data series of variable is predicted by statistically examined the behaviour of given data series of the variable's error term. These errors are shocks which is not fully capture by model, from which error terms are generated.

4. RESULTS AND DISCUSSION

At first step, the descriptive analysis is presented followed by the results of event study and regression analysis. Furthermore, the results related to ADF analysis are presented to check unit root issue in data series.

Sample data set for the statistical analysis which is used in this study is the daily observations of the KSE-100 Index by considering the adjusted closed values of KSE-100 Index for the period of 2001-2012. Descriptive statistics including mean, median, range and standard deviations are estimated for the whole data set covering total selected sample period. Results of the descriptive statistics are represented in table 4.1.

Table 4.1: Descriptive statistics of KSE-100 Index Values and Returns

	Index	Returns
Mean	7784.28	0.08191
Median	8792.07	0.13
Maximum	16943.2	8.51
Minimum	1075.16	-7.74

Std. Dev.	4533.24	1.4404					
Skewness	-0.0472	-0.2836					
Kurtosis	1.72161	6.00157					
Jarque-Bera	218.75	1147.33					
Probability	0.0000	0.0000					
Observations	3195	3194					

Table 4.1 presents the descriptive statistic for the KSE-100 Index observation which indicates that the mean value of KSE-100 Index observation for the period of 2001-2012 is 7784 and median is 8792. In the measurement of variability, standard deviation shows a value of 4533 and Range is 15868. As there is only one observation of the dispersion of the data so we cannot significantly conclude any inferences about variability in the KSE-100 Index. The skewness value is -0.0472 which is near to zero and kurtosis is less than 3 and value is 1.72. Jarque-Bera test shows that this series is not significantly normal distributed.

Descriptive statistics for the Returns are also presented in Table 4.1. Total observations are 3195 for the data covering of the duration from 2000-2012. Mean value of these observations is 0.0767 and median is 0.11 which shows the evidence for the asymmetric distribution. Skwness value is -0.237 and kurtosis value is more than 3 which shows the shape of leptokurtic distribution of the returns. By examining Jarque-Bera Test, it is concluded that return series is not symmetric distribution that is normal distribution. In normal distribution series, mean, median and mode are equal and kurtosis value is equal to 3. P-value of this test is below than 5%.

For the unit root examination, ADF has been used to check whether data is stationary or not. It is an essential condition for regression analysis and ARMA model that the data has a property of stationary. Results of ADF test are presented in table 4.2.

Table 4.2: Augmented Dickey-Fuller (ADF) Test Statistic for Returns

		Returns
	Level	t-value
ADF test statistic		-49.8***
Test critical values:	1%	-3.96
	5%	-3.41
	10%	-3.13

*** Significance level of 1%

Result of ADF test for KSE-100 Index's return series is significant. The estimated t-statistic is 49.84 which greater than the critical value at 1%, 5% and 10%. So, return series data has a stationary property at level.

Table 4.3: Correlogram's Result

	AC	PAC	Prob.		AC	PAC	Prob.
1	0.11	0.11	0	19	0.01	0.00	0
2	0.03	0.02	0	20	0.01	0.00	0
3	0.05	0.04	0	21	0.00	0.01	0
4	0.03	0.02	0	22	0.03	0.04	0
5	0.02	0.01	0	23	0.05	-.05	0
6	0.01	0.00	0	24	0.08	0.07	0
7	0.04	0.03	0	25	0.01	0.02	0
8	0.01	0.01	0	26	0.01	0.01	0
9	0.06	0.06	0	27	0.01	0.01	0
10	0.05	0.04	0	28	0.01	0.01	0
11	0.02	0.00	0	29	0.01	0.01	0
12	0.02	0.01	0	30	0.02	0.02	0
13	0.02	0.01	0	31	0.05	0.05	0
14	0.01	0.00	0	32	0.02	0.04	0
15	0.01	0.00	0	33	0.00	0.00	0
16	0.04	0.04	0	34	0.01	0.01	0
17	0.03	0.02	0	35	0.00	0.00	0
18	0.05	0.04	0	36	0.01	0.01	0

We have used five pre and post days event window for the event study analysis. In this event window, significance level of abnormal returns is examined to accept or reject the hypothesis of the study. Abnormal returns are estimated by taking difference between actual observation and estimated observation. For the estimated observation, we have used Auto-regressive Moving-average (ARMA) model by using estimation observations covering period from 2000-2012. By using correlogram test, we determined the lag orders for AR (p) and MA (q). Results of correlogram test are presented in table 4.3.

After first order AC and PAC is significantly declined which show that only first order is significant for serial correlation. On that basis, only one lag order for AR(p) and MA(q) is used, Estimated ARMA model's equation is:

RETURN = 0.0809 + 0. 0.8679 AR (1) - 0.8131 MA (1)

For the ARMA estimation, model shows three co-efficient, in which one is intercept and two are slopes. Auto-regressive (AR) (1) co-efficient is 0.867872 and Moving-average (MA) (1) is -0.81312. Results of this model indicates that return observations can be significantly predicted by lagged observation of dependant variable and one lagged observations of error term of the model. By using this estimated ARMA (1,1) model, abnormal returns are determined by taking difference between actual and estimated KSE-100 Index's returns.

Event window's results for abnormal returns are presented in Table 4.4. In event window we have five working days: pre and post period of an event with P-value that shows the significance level for the acceptance or rejection of the hypothesis. This significance level is estimated by using SPSS application with the reference point of Zero. Results are presented for abnormal returns in table 4.4 and for cumulative abnormal returns in 4.5 in the next page.

Event window for the Ashoora shows that there is a significant abnormal mean returns are observed for pre 1, pre 2 period with the abnormal positive mean value are respectively 0.75 and 0.59 at 5% significance level and post 4th window with 0.59 at 10% significance level. As we discussed earlier that there are none of study available yet

which applied event study on total selected Islamic calendar events but there are some number of studies conducted for the investigating of Islamic calendar anomaly including Ashoora, Rabi ul awal, Ramadan and Eidain such as [9]. Results of his study showed that there are significant positive returns in pre and post period of holidays in some years. In the month of Muharram, significant abnormal returns are observed by [17]. So our results are in line with the existing available literature. In the event window of Rabi ul Awal, we have strong significant evidence of the abnormal negative mean return with the value is -1.19 in the period of pre 3 window at 1% significance level. It means that there is a significant negative excess return behaviour experienced in Karachi Stock Exchange's 100-Index in the third last working day before the event of 12th Rabi-ul-Awwal. Significant negative returns were experienced in pre period of holidays. In event window of Ramadan, we observed that there is a positive significant abnormal mean return in window of pre-2, and post-1 period with the value of 0.88 and 1.22 respectively at 5% significance level. It explains that there are significant excess positive returns before Ramadan and after it. Results are in order with the study conducted by [21] who studied the Ramadan effect using event study. He found that there is a positive significant excess return in pre and post period of Ramadan.

In the event window of Eid-ul-Fitr results indicate that there is a positive significant abnormal returns in the window of pre 1, pre 2, and pre 3 and post 1 at 5% significant level. While there is no significant abnormal returns in Eid ul Adha event window. Results for Eid-ul-Fitr are same alike [21] made an event window of 35 working days which covered the Eid-ul-Fitr effect in it. His study presented that there was a significant positive abnormal returns in the event window of Ramadan working days and post of Ramadan working days period which includes some days of after Eid ul Fitr.

Table 4.5: Cumulative Abnormal Returns (CAR) window

Cumulative		precum5	Evevt	postcum5
Ashora	Mean	1.07*	0	0.90
	sig. level	0.09	0	0.22
Rabi ul Awwal	Mean	-0.60	0	0.55
	sig. level	0.41	0	0.50
Ramadan	Mean	-0.41	0.09	-0.19
	sig. level	0.55	0.21	0.82
Eid ul Fitr	Mean	1.76*	0	-0.21
	sig. level	0.00	0	0.82
Eid ul Adha	Mean	0.18	0	-1.50
	sig. level	0.69	0	0.34

*** Significance level of 1%, ** significance level of 5%, * significance level of 10%

The results of cumulative abnormal returns in table 4.5 shows that there are two significant cumulative abnormal return in event windows: pre period cumulative abnormal return of the Eid-ul-Fitr which shows a significant positive cumulative abnormal mean return value (1.7563) and pre period

cumulative abnormal return of the Ashora with positive positive cumulative abnormal mean return value (1.07).

Table 4.6: Regression Analysis Results

Months	Coefficient	t-Value	Prob.
Muharram	0.19*	1.89	0.059
Safar	0.06	0.55	0.58
RabiulAwwal	0.14	1.4	0.16
RabiuSani	0.01	0.09	0.93
JamadiAwwal	0.03	0.3	0.76
JamduSani	0.04	0.4	0.69
Rajab	-0.05	-0.52	0.61
Shaban	0.12	1.16	0.24
Ramadan	0.18*	1.66	0.09
Shawwal	0.15	1.4	0.16
ZilQada	0.14	1.44	0.15
ZilHaj	-0.02	-0.2	0.84
AR(1)	0.11	5.95	0

** Significance level of 5%, * significance level of 10%

Results of our study are in line with the study of [21] to some extent. He found the significant cumulative abnormal positive mean return in the event window of Ramadan. In his study, he used 35 days of cumulative abnormal return to examine the significant impact of Islamic calendar's month (Ramadan) on stock return.

In this study we have also investigated the total Islamic month effects on Karachi stock exchange returns behaviour. Regression analysis is used in this study as applied in [10], [25] and [23]. Results of Ramadan effect using regression analysis is given in Table 4.6.

The co-efficient of the mean return in the given table 4.5 are significant only in 1st month (Muharram) and 9th month of Islamic calendar (Ramadan). The co-efficient value is for the month of Ramadan, 0.18 and for Muharram, 0.19. It shows that there is a significant different returns experienced in the month of Ramadan and Muharram as compared to remaining months of the Islamic calendar at 10% and 5% significance level respectively. Results of the study are in line with the [10].He found that a significant positive return in month of Muharram and Ramadan. Significant positive returns are found by [2, 13]. On the basis of these results, we accept the second hypothesis that there is Islamic calendar month effect in Pakistani financial market.

In summary, we have studied the Islamic calendar anomaly in Pakistan applying two methodologies namely regression and event study. Results of event analysis indicate that there is a significant positive abnormal return in pre and post period of Ashora, Ramdan and Eid ul Fitr, Where-as significant negative abnormal returns are observed in pre period of 12th Rabi-ul-Awwal. Eidul Adha has no effect in pre and post period. While in regression analysis, we conclude that the month of Ramadan and Muharram have a positive effect on Karachi Stock Exchange.

5.   CONCLUSION

The present study is an attempt to investigate the impact of non-economic variables on stock market performance. These non-economic variables are Islamic calendar events like Ashoora, Eid ul Fitr, Eid ul Adha, and 12th Rabi-ul-awal and Islamic calendar months from Muharram to Zil-Haj. We attempt to consider and capture the both Islamic calendar month and Islamic holiday's effect on KSE-100 Index. These Islamic holidays are Ashoora, Eid ul Fitr, Eid ul Adha, and 12th Rabi-ul-awal.

Results of the study reveal that the events have a significant impact on the stock return in studied period except the event of Eid-ul-Azha. Significant abnormal returns are observed in pre-period of Ramadan, Ashora, Rabi-ul-Awal and Eid-ul-Fitr event window. However, significant abnormal returns for the post event window for Ramadan and Eid-ul-Fitr are only observed. On the basis of these results, it is concluded that there is a Islamic calendar anomaly in Pakistani stock market and this result are consistent with the existing literature in finance field as [9 ,21 ,10 , 17, 13, 12].

Second method which is applied to investigate the Islamic calendar effect is regression analysis. Results of this analysis indicate that there are significant different returns observed in month of Ramadan and Muharam as compared to other Islamic calendar months. These finding are in line with the [2, 13] and [10]. This study reveals that there is a significant Islamic calendar month anomaly in Karachi stock exchange in Pakistan.

Existence of Islamic calendar anomalies in Karachi Stock Exchange shows that in the presence of these calendar effects, investors can outperform the market and this is against the principal of market efficiency that no one can earn above the market. Existence of anomalies increases prediction power of investors and they become able to predict stock returns with more confidence. This helps them to beat the market.

Investors seeking fast profits in the Muslim world should try to profit by buying shares in the mid Ramadan and selling them at the end of the holy month (Ramadan) or preferably immediately after Eid ul-Fitr. Positive significant abnormal returns are also observed in the pre-1 and 2 day of event window of Ashora. It implies that investor could make profit above average by buying in the end of the last month of Islamic calendar (Zil-Haj) and sell them in the end of first week of Muharram. Of course, there are transactions costs that one would need to take into account, but any such costs would be considered at the time when returns are observed. However, in the long run, it could not be the effective strategy as arbitrage policy works only in short run, and in long run, arbitrage is adjusted automatically through mean reversion and thus, cannot give desirable results in long run.

Moreover, Karachi Stock Exchange is a thin market where very large number of investors are not present, rather, few investors possess major chunks of the market and so they can not only can outperform the market by following the arbitrage policy in short run but also can control. As Pakistani stock market has a very anomalous behaviour toward returns as observed in this study. The presence of these anomalies in Pakistani capital market, have dark impact on the market efficiency. It is a shocking point for policy makers. They should focus for implementing such policies to overcome the anomalistic behaviour of market and protect the investors against the abnormal returns. The state Bank of Pakistan (SBP) and Security Exchange of Pakistan (SECP) can play vital role to eliminate impact of these anomalies on stock returns.

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