

# The Islamic Calendar Effect in Karachi Stock Market

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*This study used both conditional and unconditional risk analyses to investigate the Islamic calendar effect in Karachi stock market. In addition, risk is allowed to vary across the month of Islamic calendar. Five models are used starting from simple model of Islamic calendar effect to conditional risk model. Different models produce different result. Ziqad effects are found in all models where as Shawal effect is found all models except in one model. It shows that there is after Ramdhan effect in Karachi Stock market. However, it is noted that Karachi stock market is relatively low risky market during the month of Ramdhan.*

## 1. Introduction:

Calendar anomalies are one of the features of financial market, which is against the efficient market hypothesis. Many researchers investigate the calendars anomalies which are based on Gregorian calendar. However, different countries and societies also follow their own calendar, which are based on religion in addition to Gregorian calendar. For example, Jewish society follow Hebrew calendar, which strictly based on luni-solar, the Christen society follows Gregorian calendar, which based on solar, Hindu and Chinese follow their own calendar. Muslim society follows the Islamic calendar, which is based on a lunar calendar, referred to as the Hijri calendar. This calendar contains twelve months that start with the appearance of new moon. The average days in a lunar month contain only 29.53 days that is why Islamic year is approximately eleven days shorter than the Gregorian year.

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In these religious calendars, there are religious days and month, which these societies observed e.g. Christen society celebrated X-miss days, Deepvali by Hindu society, and Vesk day by Buddhist. Like these religious days Muslim societies also observed and celebrated the religious month like as Ramdhan and Aashoora and day like Eid-ul-Fitar and Eid-ul-Azha.

Ramdhan is the ninth month of Islamic calendar and it is treated as the Holy month. It is the month of fasting in which prohibition of eating, drinking and smoking in daytime i.e. from early in the morning to sunset in evening. Hotels and restaurants are closed in day times. In addition this month is motivated towards the religious activity. Most of the time spends on Salt-ul-Nafil, Recitation of Quran, participation in social services and in the last decade of Ramdhan people sit on AAITAKAF, to search LAILA-TUL-QADAR. Some people visit to Makka to perform UMMARAH. As a result people improve their affiliation to Allah, i.e. fearness of Allah. As a result Muslims avoid to sin and wrongdoing such as speculation and gambling which is obviously the mettle of stock exchange. The working hours of the offices and business activity reduced. Due to such change in Ramdhan as compared to other month, it is interesting to examine the behavior of trading activity under such situation.

After the end of the Ramdhan, Muslim society celebrated Eid-ul-Fitar, which come immediate end of the Ramdhan. People purchase new cloths, and decorated their houses. It is observed that food prices, prices of cloths and prices of other commodities increase during this month. The behavior of the people during this month ultimately impact on financial market trading activity. It decreases the volatility of stock market in volume and stock returns in Pakistan (Hussain, 1998). This phenomenon is not observed in Pakistan's financial market only it also observed in Saudi Arabia stock market. Seyyed, Abraham and AlHajj (2005) reported that the volatility and trading activity (volume as well as return) decline in Saudi Arabia stock market during Ramdhan. Though Hussain (1998) investigated the Ramdhan effect in Pakistan stock market and found less volatility during Ramdhan but he cannot report the behaviour of average return before and after Ramdhan.

After celebrated Eid-ul-Fitar, the prices become normal. In month of Zil-Hajj, people slaughtered the animal like as cow, goat, camels' etc, to follow the Sunnat-e-Ibrahim. It increases the consumption of people, which reduces the purchasing power hence saving decreases. Aashoora come after Eid-ul Azha, which observed as mourning month.

Due to such change in these months as compared to other month, it is interesting to examine the behavior of trading activity under such situation. The purpose of this study is to investigate that is there any different in trading activity in Ramdhan from the other months. The rest of the paper is organized such that second section describes the review of literature, econometric methodology and related issues described in section three. The empirical findings and interpretation are presented in section four. Section five provides the concluding remarks

## **2. Review of literature:**

Though a lot of attention has been given on calendar anomalies but a little attention is given on the religious calendar effect on stock markets. For example, religious holidays effect on S&P500 index and NYSE trading volumes Frieder and Subrahmanyam (2004). These holidays focused on the Jewish High Holy Days of Rosh Hashanah and Yom Kippur and the Christian holy day of St. Patrick's. They reported that volume declined on Rosh Hashanah and Yom Kippur, and that prices tended to increase during the two days that precede Rosh Hashanah and St. Patrick's.

There has been given little attention to the Islamic calendar effect. However, some studies are available on the impact of Ramadan on stock returns. Alper and Aruoba (2001) analyze various macroeconomic variables in Turkey, and show that the usual seasonal adjustment procedures based on fixed holidays often fail to remove all seasonality when the series are subject to moving holidays like Ramadan. However, they did not find any significant Ramadan effect in Istanbul stock market. Moreover, Husain (1998) analyzed the Ramdhan effect in Pakistani stock market and demonstrated that

volatility is significantly lower during the weeks of Ramadan. He does not find any significant changes in average returns during Ramadan. However, he did not compare the mean average return before and after Ramdhan. Seyyed, Abraham, and Al-Hajji (2005) investigated the Ramdhan effect in Saudi Arabian stock market. They analyzed several sector indices in the market and showed that volatility and trading activity disappeared significantly during Ramadan. Their findings are identical to Husain (1998) findings i.e. they did not find any significant change in average returns during Ramadan and did not look before and after Ramdhan.

### 3. Methodology

To study the Islamic calendar effects the methodology of Ariel (1987), Lakonishok and Smidt (1988), Jaffe and Westerfield (1989) is used. However, some amendment has been proposed in this methodology. In this model the excess stock returns ( $R_t$ ) are regressed on Muharram, Shahban, Ramdhan, Shawal, Ziqad, Zilhajj.

$$R_t = \delta_1 D_{1t} + \delta_2 D_{2t} + \delta_3 D_{3t} + \delta_4 D_{4t} + \delta_5 D_{5t} + \delta_6 D_{6t} + \varepsilon_{1it} \quad (1)$$

Where  $D_{1t}$  to  $D_{6t}$  represent the Islamic calendar effects 0, 1 dummy variable for Muharram, Shahban, Ramdhan, Shawal, Ziqad, and Zilhajj. The error term is assumed to be independent and identically distributed with a zero mean and constant variance. Equation 1 is the simplest test for stock market Islamic calendar effects. Statistically insignificant estimated coefficients in equation 1 provide no evidence of Islamic month effects. There is no risk factor in this model. If risk factors are incorporated in this model, daily returns can be higher or lower on before and after selected Islamic month because risk is higher or lower. Equation 2 explains turn of the Islamic month dummy variables and a market risk factor RF, provided by the excess returns on the GARCH basis.

$$R_t = \delta_1 D_{1t} + \delta_2 D_{2t} + \delta_3 D_{3t} + \delta_4 D_{4t} + \delta_5 D_{5t} + \delta_6 D_{6t} + \beta_t RF_t + \varepsilon_{1it} \quad (2)$$

In equation 2, the risk factor is constant across the Islamic months. This can be improved upon by adding slope interaction dummy variables that allow risk to vary across the

selected Islamic months. After incorporating dummy variable in risk factor the equation 2 become.

$$R_t = \delta_1 D_{1t} + \delta_2 D_{2t} + \delta_3 D_{3t} + \delta_4 D_{4t} + \delta_5 D_{5t} + \delta_6 D_{6t} + \sum_{i=1}^7 \beta_i RF_i + \varepsilon_{1it} \quad (3)$$

Equations 1 to 3 are unconditional risk models where world market risk is assumed to have a symmetric impact on emerging stock market returns. Another approach to examine for turn of the Islamic month effects is to use a conditional risk factor in equation 3. There may be an asymmetric relationship between stock returns and market risk where positive market returns have a different impact on stock returns than do negative market returns (Fletcher (2000), Pettengill, Sundaram and Mathur (1995)). Equation 4 shows the conditional risk factor that relates to stock returns to market risk.

$$R_t = \delta_1 D_{1t} + \delta_2 D_{2t} + \delta_3 D_{3t} + \delta_4 D_{4t} + \delta_5 D_{5t} + \delta_6 D_{6t} + \beta_{p_i} RF_i + \beta_n RF + \varepsilon_{1it} \quad (4)$$

where  $D_{p_i}$  is a dummy variable takes on a value of 1 for positive risk factor and 0 otherwise and  $D_{n_i}$  is a dummy variable takes on a value of 1 for negative risk factor and 0 otherwise .

$$R_t = \delta_1 D_{1t} + \delta_2 D_{2t} + \delta_3 D_{3t} + \delta_4 D_{4t} + \delta_5 D_{5t} + \delta_6 D_{6t} + \sum_{i=1}^6 \beta_{p_i} RF_i + \sum_{i=1}^6 \beta_n RF + \varepsilon_{1it} \quad (5)$$

Equation 5 is a conditional model relating excess stock returns to market returns that also includes slope interaction terms between the before and after selected Islamic months variables and the up or down excess market returns. This model allows conditional risk to vary across the Islamic months.

#### 4. Data

The data used in this study is daily covered from March 1998 September 2004. The data for stock prices are taken from Daily Business Recorder. The return is calculated by the difference of two successive log stock prices.

This sample period is interesting in that diverse kinds of information were generated during this period. Numerous major events that took place during this period had implications for the stock market. First, the nuclear tests of May 28, 1998 by Pakistan; It created deep effect on the financial sector in two ways: (i) the imposition of economic sanctions by foreign countries, (ii) internal handling of affairs by declaration of emergency under article 232 and freezing of foreign currency accounts. Second, the controversy between IPP's (Independent Power Producers) and Government of Pakistan regarding the HUBCO project peaked during this time. The contribution of HUBCO in the total trading volume of KSE is large so is its importance in KSE-100 index. Therefore any factor that affects HUBCO can significantly affect the aggregate activity in stock market. Consequently, any news regarding HUBCO affects the activity of stock exchange. Third, Military regime came into Power. This resulted in uncertainty in domestic business environment accompanied by further economic sanctions by foreign governments. Fourth, efforts to increase the tax base of the country by the government but which were opposed by the business also affected the stock market. Fifth, the government has initiated a basic program of reforms that takes into account, the needs of a efficient and growing economy. Sixth, 9/11 events i.e. terrorists attack in New York and Washington. These challenges were faced to deal with the situation. Pakistan became the main focus of the US response to the 9/11 and playing the role of a front line state. The repercussions of 9/11 were seen in Pakistan economy in the shape of deterioration of export and import, and slow economic growth. Seven, The war in Afghanistan and Iraq also have impact on Pakistan economy. As a result the additional expenditure tightens the fiscal situation. The 9/11 incidence has immediately victimized stock market. Despite strong fundamentals, stock values fell like proverbial ninepins as the KSE-100 index plunged to close 1000, lowest since its historic low in June 1998, just after nuclear test.

## **5. Empirical Findings**

The Islamic calendar effects exhibited in table 1, which is estimated from equation 1. The result indicates that the average return in the month of Ramdhan is smaller and insignificant, which indicates that there is no Ramdhan effect in Karachi stock market.

However the positive and significant average return is found in the month of Shawal and Ziqad. It implies that there is after Ramadan effect in Karachi stock market because these two months come after Ramadan and Eid festival. During this month and for Eid festival the consumption of people increases and they have less attention towards the investment

**TABLE 1**  
**ISLAMIC MONTH EFFECT WITHOUT MARKET RISK FACTOR**

| Days     | Coefficient         | Standard Error | t-value | p-value | Skewness | Kurtosis |
|----------|---------------------|----------------|---------|---------|----------|----------|
| SHABAN   | 0.0009              | 0.0016         | 0.5952  | 0.5518  | 6.147    | 50.499   |
| RAMDHAN  | 0.0028              | 0.0018         | 1.5418  | 0.1233  | 5.743    | 39.094   |
| SHAWAL   | 0.0033 <sup>b</sup> | 0.0018         | 1.8091  | 0.0706  | 13.027   | 234.172  |
| ZIQAD    | 0.0033 <sup>b</sup> | 0.0017         | 1.8755  | 0.0609  | 6.857    | 58.485   |
| ZILHAJJ  | 0.0002              | 0.0017         | 0.1493  | 0.8813  | 5.745    | 41.407   |
| MUHARRAM | -0.0009             | 0.0016         | -0.6070 | 0.5439  | 6.034    | 48.157   |

F-values=1.49 (p=0.196)  $R^2 = 0.004$

- a Significant at 1%
- b Significant at 5%
- c Significant at 10 %

in stock market. After Ramdhan and Eid people concentrate to invest in stock market that is why trading activity increases in the month of Shawal and Ziqad in Karachi stock market. Moreover, higher kurtosis and higher positive skewness are found in the month of Shawal. It indicates that investors prefer to invest in this month.

After adding the risk factor in equation 1, the coefficients of the average mean return in the month of Shawal is significant and increases. Table 2 shows the same. Some additional Islamic effects are picked up i.e. the month of Ramdhan. Moreover, the coefficient of risk factor is negatively significant and less than unity; it indicates that Karachi stock market is relatively low risky market during the month of Ramdhan. However the average mean return in the month of Ramdhan and Ziqad are also positive and significant

**TABLE 2**  
**ISLAMIC MONTH EFFECT WITH MARKET RISK FACTOR**

| Days        | Coefficient          | Standard Error | t-value | p-value |
|-------------|----------------------|----------------|---------|---------|
| SHABAN      | 0.0020               | 0.0017         | 1.2186  | 0.2232  |
| RAMDHAN     | 0.0036 <sup>b</sup>  | 0.0018         | 1.9719  | 0.0488  |
| SHAWAL      | 0.0045 <sup>b</sup>  | 0.0018         | 2.4015  | 0.0164  |
| ZIQAD       | 0.0043 <sup>b</sup>  | 0.0018         | 2.4232  | 0.0155  |
| ZILHAJJ     | 0.0011               | 0.0018         | 0.6312  | 0.5280  |
| MUHARRAM    | -0.0001              | 0.0016         | -0.0478 | 0.9618  |
| RISK FACTOR | -0.0776 <sup>a</sup> | 0.0280         | -2.7628 | 0.0058  |

F-values=2.52 (p=0.019) R<sup>2</sup> =0.009

- a Significant at 1%
- b Significant at 5%
- c Significant at 10 %

After adding dummy variable in risk factor with Islamic months only Shaban, Shawal and Ziqad effect are found. Table 3 shows the same. With and without risk factors the significant excess return is found in the month of Ziqad.

Equations 4 and 5 are conditional models that indicate the asymmetric market effects. Equation 4 is the extension of equation 3 in which positive and negative returns are added. The estimated result shows in table 4, which indicates that the Shawal and Ziqad effect in Karachi stock market. However, the positive and negative stock returns are statistically significant.

**TABLE 3**  
**ISLAMIC MONTH EFFECT AND MARKET RISK FACTOR**

| Days                          | Coefficient          | Standard Error | t-value | p-value |
|-------------------------------|----------------------|----------------|---------|---------|
| SHABAN                        | 0.0042 <sup>c</sup>  | 0.0025         | 1.6520  | 0.0987  |
| RAMDHAN                       | 0.0027               | 0.0027         | 1.0137  | 0.3109  |
| SHWAL                         | 0.0003               | 0.0022         | 0.1491  | 0.8814  |
| ZIQAD                         | 0.0066 <sup>a</sup>  | 0.0024         | 2.6796  | 0.0074  |
| ZILHAJJ                       | -0.0005              | 0.0028         | -0.1860 | 0.8524  |
| MUHARRAM                      | 0.0074 <sup>a</sup>  | 0.0024         | 3.0830  | 0.0021  |
| Market Risk Factor with Month |                      |                |         |         |
| SHABAN                        | -0.2310 <sup>c</sup> | 0.1396         | -1.6538 | 0.0984  |
| RAMDHAN                       | 0.0009               | 0.1967         | 0.0045  | 0.9963  |
| SHWAL                         | 0.1929 <sup>b</sup>  | 0.0860         | 2.2411  | 0.0252  |
| ZIQAD                         | -0.2444 <sup>b</sup> | 0.1288         | -1.8975 | 0.0579  |
| ZILHAJJ                       | 0.0660               | 0.1889         | 0.3494  | 0.7268  |
| MUHARRAM                      | -0.7075 <sup>a</sup> | 0.1490         | -4.7468 | 0.0000  |

F-values=4.41 (p=0.00) R<sup>2</sup> =0.061

- a Significant at 1%
- b Significant at 5%
- c Significant at 10 %

The estimation results from equation 5 depicted that some of the Islamic month effect found in Karachi stock market. Comparing across Tables 1 to 5, Shawal and Ziqad is prominent in Karachi stock market.

**TABLE 4**  
**ISLAMIC MONTH EFFECT WITH CONDITIONAL MARKET RISK FACTOR**

| Days            | Coefficient | Standard Error | t-value   | p-value |
|-----------------|-------------|----------------|-----------|---------|
| SHABAN          | -0.000123   | 0.000922       | -0.133384 | 0.8939  |
| RAMDHAN         | 0.001760    | 0.000984       | 1.788061  | 0.0740  |
| SHWAL           | 0.003085    | 0.001011       | 3.050835  | 0.0023  |
| ZIQAD           | 0.003097    | 0.000966       | 3.206791  | 0.0014  |
| ZILHAJJ         | 5.25E-05    | 0.000973       | 0.053941  | 0.9570  |
| MUHARRAM        | -0.000189   | 0.000895       | -0.211063 | 0.8329  |
| RISK FACTOR (+) | -0.804288   | 0.018980       | -42.37544 | 0.0000  |
| RISK FACTOR (-) | -0.000123   | 0.000922       | -0.133384 | 0.8939  |

F-values=576.45 (p=0.00)  $R^2 = 0.717$

- a Significant at 1%
- b Significant at 5%
- c Significant at 10 %

**TABLE 5**  
**ISLAMIC MONTH EFFECT AND CONDITIONAL MARKET RISK FACTOR**

| Days                            | Coefficient          | Standard Error | t-value | p-value |
|---------------------------------|----------------------|----------------|---------|---------|
| SHABAN                          | 0.0023               | 0.0022         | 1.0281  | 0.3040  |
| RAMDHAN                         | 0.0018               | 0.0023         | 0.7604  | 0.4471  |
| SHWAL                           | 0.0001               | 0.0019         | 0.0242  | 0.9807  |
| ZIQAD                           | 0.0026               | 0.0021         | 1.2295  | 0.2191  |
| ZILHAJJ                         | 0.0006               | 0.0023         | 0.2548  | 0.7989  |
| MUHARRAM                        | -0.0001              | 0.0021         | -0.0533 | 0.9575  |
| Positive Risk Factor with Month |                      |                |         |         |
| SHABAN                          | 0.7974 <sup>a</sup>  | 0.1484         | 5.3734  | 0.000   |
| RAMDHAN                         | 1.0354 <sup>a</sup>  | 0.2041         | 5.0722  | 0.000   |
| SHWAL                           | 0.3065 <sup>a</sup>  | 0.1056         | 2.9024  | 0.003   |
| ZIQAD                           | 1.0999 <sup>a</sup>  | 0.1472         | 7.4687  | 0.000   |
| ZILHAJJ                         | 1.0084 <sup>a</sup>  | 0.1878         | 5.3680  | 0.000   |
| MUHARRAM                        | 1.0941 <sup>a</sup>  | 0.2077         | 5.2656  | 0.000   |
| Negative Risk Factor with Month |                      |                |         |         |
| SHABAN                          | -1.0432 <sup>a</sup> | 0.1387         | -7.5207 | 0.0000  |
| RAMDHAN                         | -0.9614 <sup>a</sup> | 0.1997         | -4.8130 | 0.0000  |
| SHAWAL                          | 0.1235               | 0.0872         | 1.4163  | 0.1569  |
| ZIQAD                           | -0.9203 <sup>a</sup> | 0.1214         | -7.5805 | 0.0000  |
| ZILHAJJ                         | -0.9876 <sup>a</sup> | 0.1939         | -5.0933 | 0.0000  |
| MUHARRAM                        | -0.9542 <sup>a</sup> | 0.1274         | -7.4891 | 0.0000  |

F-values=37.013 (p=0.00) R<sup>2</sup> =0.285

- a Significant at 1%
- b Significant at 5%
- c Significant at 10 %

## 6 CONCLUSION

Using the data of KSE-100 index from March 1998 to September 2004 this study used both conditional and unconditional risk analyses to investigate the Islamic calendar effect in Karachi stock market.. In addition, risk is allowed to vary across the month of Islamic calendar. Five models are used starting from simple model of Islamic calendar effect to conditional risk model. Different models produce different result. Ziqad effects are found in all models where as Shawal effect is found all models except in one model. It shows that there is after Ramdhan effect in Karachi Stock market. However, it is noted that Karachi stock market is relatively low risky market during the month of Ramdhan.

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