

Islamic Calendar Anomaly and Market Return Behavior: Empirical Evidence from Eight Islamic Economies

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Abstract

This study is aimed to explore the Islamic calendar anomaly or lunar effect over the period of eleven years commencing from Zilhajj 1429 (January 2007) to Muharram 1440 (September 2018) on daily historical returns. This study has identified the essence of weak-form Efficient Market Hypothesis Fama (1965) in Pakistan, Turkey, Malaysia, Bangladesh, Iran, Egypt, Saudi Arabia, and Dubai. Moreover market return behavior and seasonal effects are identified by using the dummy regression

Key Words

Islamic Calendar anomaly,
Efficient Market, Behavioral
Finance

model. It is identified that anomalous behavior is reality in long run aptitude in all Islamic economies and the average behavior is reflecting that markets have been inspired by the seasonal effects. Overall the market behavior reflects weak form of efficiency except Iran and Bangladesh. It is identified that the Gregorian Calander is static but the lunar calendar is dynamic and go across all the weathers. Weathers and temperatures may affect perception and psychology of investor.

Introduction

Calendar anomalies i.e. day of the week effect, weekend effect and Month effect in the equity market has already been widely studied in the research of finance. The effect of Islamic Month illusion is a phenomenon that can be used to develop an anomaly for supporting the theory of market efficiency. In accordance, market efficiency indicates that future equity prices are not based on historical data Fama (1965) and it is a random behavior. This independency reflects that efficient market does not allow taking abnormal profits in any capacity. The equity market prices are dependent upon the equilibrium of supply and demand of aggregate equity. The calendar anomalies are the basic premise of capital market movements as per behavioral perspective. It may go against the EMH phenomena due to the violation of the week form of market efficiency. The researchers investigated that Islamic calendar anomalies move through Gregorian calendar anomalies. However, different countries and regional societies are being followed by their own calendar as well. It may be on religion-based as the Jewish follow Hebrew calendar which depends on lunar-solar, the Christians follows Gregorian calendar which depends upon solar. Hindus and Chinese societies follow their own calendar with their religious perspective. Christians celebrate charismas, Hindus celebrate Deepawali and Buddhists celebrate Vesak day. Muslims follow Islamic calendar which depends upon the lunar calendar. The lunar calendar linked to the Hijri calendar in accordance with Islamic ideology days and months. The religious days and months observed in Muslim society i.e. Ramadan, Muharram, Ashura, Eid - ul - Fitr and Eid – ul – Adha. Pakistan is the country of 97% Muslim population.

The Gregorian calendar is used as well as the Islamic calendar use across all equity market for economic activity. The Gregorian calendar is used due to the best coordination of economic activities with the rest of world. The Islamic calendar is used by date, events and marked annual holiday i.e. Eid events. The Muslim festivities and holidays are important with reference to economic activities and trading at the stock market. The equity markets are closed for 9 days at average level every year. The Islamic year is 11 days shorter as compared to Gregorian calendar year. It varies every year at most of a week and half in accordance with the Gregorian calendar. The Islamic months are i.e. Muharram, Safar, Rabi ul Awal, Rabi ul Sani, Jammadi ul Awwal, Jammadi ul Sani, Rajab, Shaban, Ramadan, Shawal, Zul Qa, ad and Zilhajj. Therefore, the calendar impact on equity returns for different countries may offer interesting insights regarding economic

activities. Chien et al. (2002) and Mills and Coutts (1995) have documented that the presence of calendar anomaly in an equity markets returns is actually question mark to the fair play of markets. However, on the other hand, the researchers argued that the nonexistence of Islamic calendar anomaly. Arsad and Coutts (1997), Hamori (2001) and Mehdiian and Perry (2002) and explained about the several investors well aware of seasonal patterns then there a seasonality must be disappeared. Holden et al. (2005) also explored about dependence of calendar anomaly of investment strategy that is risky that materialize the calendar anomaly. Our study is an innovative perspective which will fill the gap to visualize the illusion and reality in eight Islamic economies across the Islamic months with a long time series of historical data. In first part of the study we briefly introduced calendar anomaly. The second segment is composed of literature review. The third part of this study consists of result and discussions. The last component elaborates the conclusion of this study.

Literature Review

Fama (1970) proposed the efficient market theory, equity markets postulate a random walk. The equity prices which are not predictable and no investor can take the abnormal profits due to monopolistic access to information. Fama (1998) documented that the new theories which are based on trend and fashion of market due to existence of anomalies. Al – Khazali (2014) explored the effect of Ramadan from the period of 1996 – 2012. The risk-averse investor can attain the more utility which can be switched from non-Ramadan to Ramadan and confirmed the result of Bialkowski et al. (2012) of more returns which observed in Ramadan as compared to another period in a year. The positive mood resulting due to fasting enhances the health of the investor Saleh et al. (2005). The communal worship can have implication for herding behavior through maximization positive social mood (social interaction). The trading behavior with a positive mood of investor is used to produce greater returns within Ramadan Al-Hajieh et al. (2011). The Islamic month of the year effects a common anomaly examined in stock exchanges. This effect regarding equity return varying and change held month to month. In General, it is also observed and believed that Ramadan and Moharram reflected higher returns by empirical findings as to another period of Islamic year. That is the basic logic to call it Ramadan effect and Moharram. Gultekin-Gultekin (1983) explored that existence of the effect of January which is examined. Abbas and Abdelhédi-Zouch (2015) investigate that the hajj pilgrimage can have an influence on the sentiments of investors and performance of equity market. The Islamic investor's sentiments are at optimal level after Zilhajj pilgrimage as before the religious event. The hajj pilgrimage is positively associated with the emotions of the investor's of Islamic countries, due to the believed to be closer to Allah.

It can lead to maximization of sentiment for the decisions of investment. Gavriilidis et al. (2016) examined US investors' sentiment. The herding is significant and higher during Ramadan in most markets. The individuals are followed the behavioral norms and beliefs with reference to the activity of the society. Wasiuzzaman (2017) found that the returns are less as compared to the volatility level higher within the Hajj period. Gao (2005) documented calendar effects in China stock market which is not consistent later on in the sample period. The Chinese have February a year-end so; they can gain more returns in March and April. The daily patterns study presented that there are potential profits on Friday. Giovanis (2009) examined the seasonality and rejected most in all calendar effect. Recent attention with reference to the PSX (Pakistan Stock Exchange) as well to research if there is an existence of an anomaly in the PSX.

Data and Methodology

We have used the daily Stock Indexes of Pakistan, Turkey, Malaysia, Bangladesh, Iran, Egypt, Saudi Arabia and Dubai from the period of five years from Ramadan 2013 to Shaban 2018. and published data were available.

$$R_t = \ln \left(\frac{P_t}{P_{t-1}} \right) \times 100 \quad (1)$$

R_t is the daily return on equity markets indexes of eight countries on day t . P_t and P_{t-1} are daily index. To examine the relationship between variables econometrics techniques have been applied. To examine the calendar anomaly effect we employed the following OLS:

$$R_t = \alpha_t + \beta_1 D_1 + \beta_2 D_2 + \beta_3 D_3 + \beta_4 D_4 + \beta_5 D_5 + \beta_6 D_6 + \beta_7 D_7 + \beta_8 D_8 + \beta_9 D_9 + \beta_{10} D_{10} + \beta_{11} D_{11} + \beta_{12} D_{12} + \mu t \quad (2)$$

Where

R_t = Daily returns
 D_1 = Ramadan
 D_2 = Shawal
 D_3 = Zul Qa, ad

- D_4 = Zilhajj
- D_5 = Muharram
- D_6 = Safar
- D_7 = Rabi ul Awwal
- D_8 = Rabi ul Sani
- D_9 = Jamadi ul Awwal
- D_{10} = Jamdul Sani
- D_{11} = Rajab
- D_{12} = Shaban
- μ_t = Error term

If we are to analyze Ramadan than D_1 and the rest are 0. If it is Shawal that we are analyzing, then $D_{12} = 1$ and rest of the months would have '0' as the dummy variable. μ is a random error term. β_1 to β_{12} co-efficient to use an OLS.

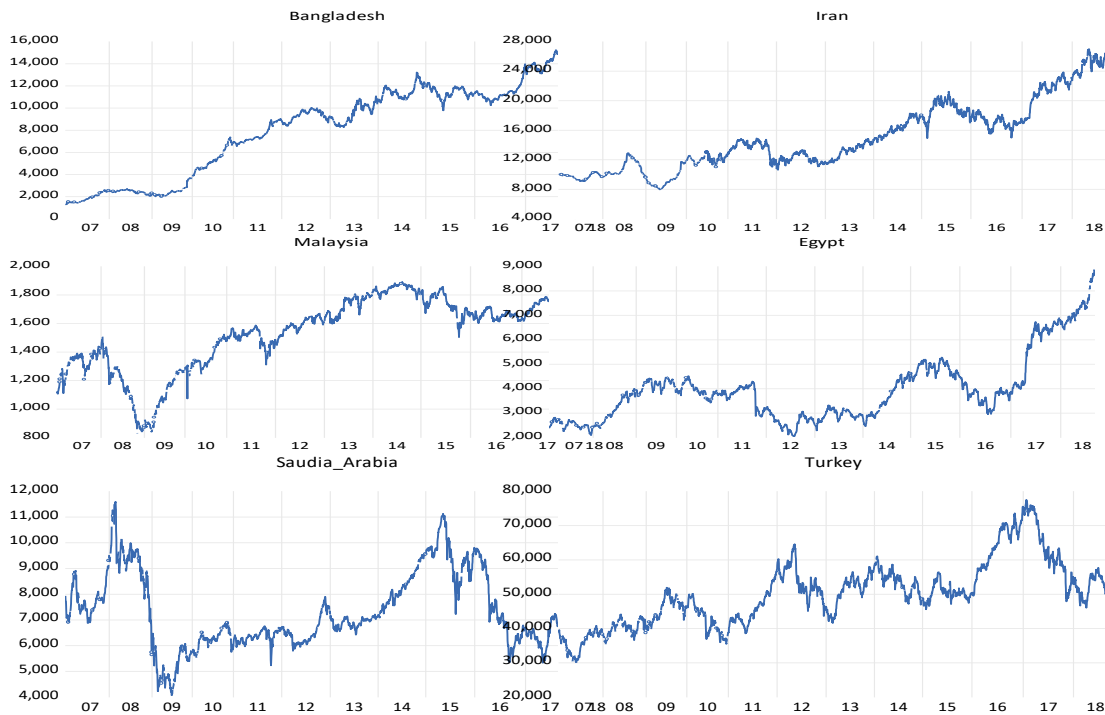
Hypothesis

This study will test the reality or illusion perception and the hypothesis of this study is as followed.

- H₀**: Islamic Month effect does not exist in Islamic equity markets.
- H₁**: Islamic Month effect does exist in Islamic equity markets.

Results and Discussion

The data of eight Islamic countries have been used to identify the level of historical volatility and mean-reverting behavior of returns with an Islamic calendar anomaly perspective for the period 2007 to 2018. Figure 1 indicates the line graph of stock indices of Pakistan, Iran, Bangladesh, Egypt, Malaysia, Turkey, Dubai and Saudi Arabia for 2007 to 2018.



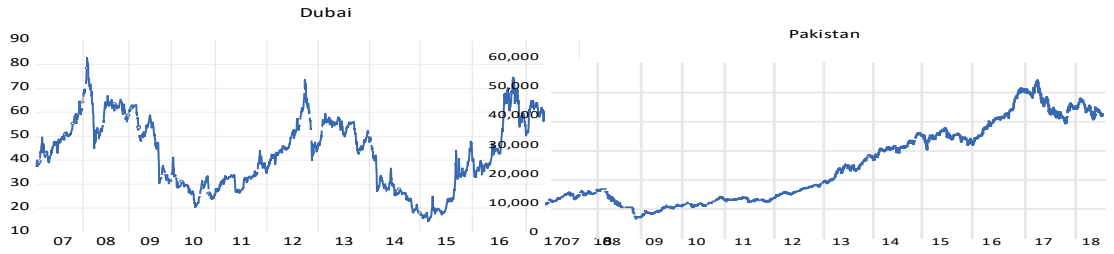


Figure 1. Stock Indices Patterns from the Year 2007-2018

Below figure 2 indicates that in the year 2008 financial crises did not affect by the Islamic Calendar behavior.

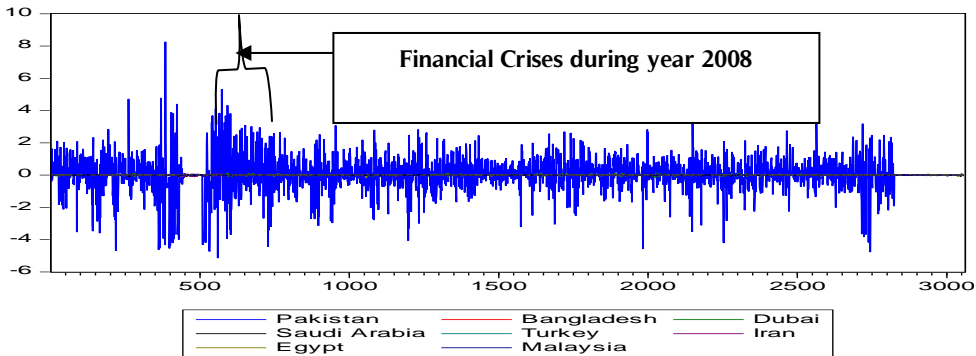


Figure 2. Daily Return Behavior of Islamic Economies

Figure 2 indicates the patterns indicated that Malaysia and Turkey moved together in the months of Jamadi ul Sani to Zilhajj. However, in the month of Ramadan, the behavior of the return remained positive but moved in negative direction immediately in the months of Shawal. This element justified the existence of calendar anomaly.

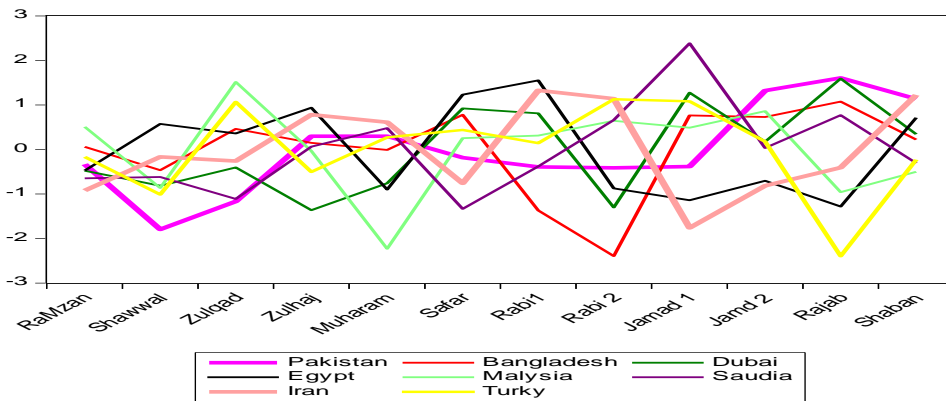


Figure 3. Cumulative Mean Return Behavior of Islamic Economies

Table 1. Return versus Volatility for Each Islamic Month for 2007-2018

Months	Mean Return	Volatility (S.D)	Rank	Month	Mean Return	Rank	Month	Volatility (S.D)
Ramzan	0.001	0.132	1	Rajab	0.020	1	Shawal	0.134

Shawal	-0.013	0.134	2	Jamadi ul sani	0.018	2	Ramzan	0.132
Zul Qa,ad	-0.006	0.132	3	Shaban	0.016	3	Zul Qa, ad	0.132
Zilhajj	0.007	0.102	4	Zilhajj	0.007	4	Jamadi ul sani	0.115
Muharam	0.007	0.105	5	Muharam	0.007	5	Safar	0.115
Safar	0.003	0.115	6	Safar	0.003	6	Rajab	0.112
Rabi ul awwal	0.001	0.082	7	Jamadi ul awwal	0.001	7	Rabi ul awwal	0.105
Rabi ul sani	0.000	0.097	8	Rabi ul awal	0.001	8	Muharam	0.105
Jamadi ul awwal	0.001	0.101	9	Ramzan	0.001	9	Zilhajj	0.102
Jamadi ul sani	0.018	0.115	10	Rabi ul sani	0.000	10	Jamadi ul awwal	0.101
Rajab	0.020	0.112	11	Zul Qa,ad	-0.006	11	Rabi ul sani	0.097
Shaban	0.016	0.105	12	Shawal	-0.013	12	Shaban	0.082

The month of Rajab, Jammad ul Sani and Shaban remained highest and returns for the month of Zul Qa, ad and Shawal remain lowest even negative. However, the volatility is seen on highest nodes in the month of Shawal, Ramzan and Zul Qa, ad. Rajab the most prominent regarding risk and return is Jamadi ul Sani and Zilhajj.

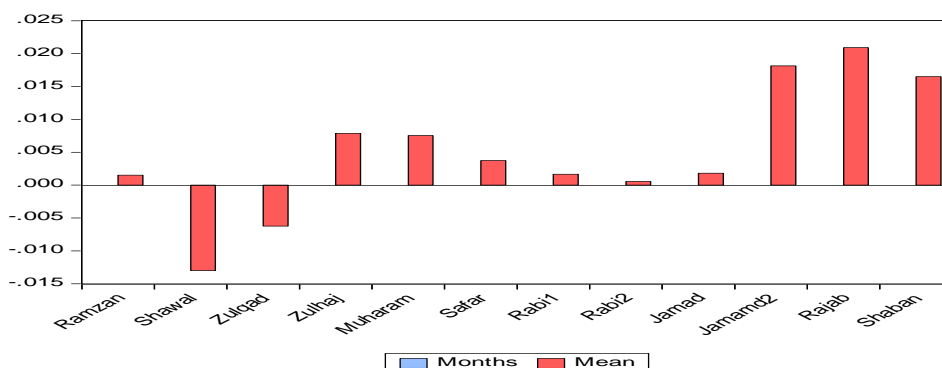


Figure 4. Month-wise Pattern of Mean Returns

Figure 3 indicates that the mean returns are positive in Ramadan but highly negative in Shawal. The happiness due to spiritual attachment and attention towards the rituals in the Ramadan due to Islamic ideology. Our study is in line with the studies of (Seyyed et al. 2005; Al-Ississ, 2010; Bukhari et al. (2011), Białkowski et al. 2013; Halari et al. 2015 and Al-Khazali et al. 2017). Mustafa (2005) indicated that Shawal effect was found in Karachi Stock Market. Further, Shah et al (2015) indicated that positive Shawwal effect and negative volatile in Shawwal. However, gradually the negative trend reduced in Zul Qa, ad, again in a study Mustafa (2005) identified that the month of Zul Qa, ad effects are found in all models being used. but the anomalous behavior got positive in the month of Zilhajj Muslim investor adopt bullish sentiments more in Zilhajj due to spending pattern in this holy month of pilgrimage (the Fifth Pillar of Islam) and sacrifice.

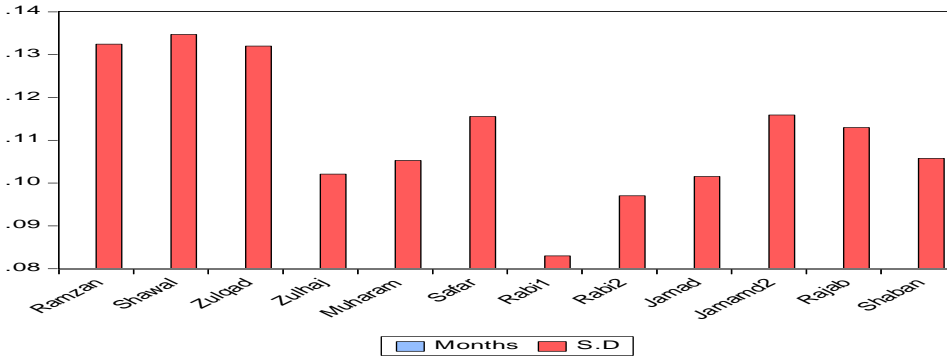


Figure 5. Month-wise Pattern of Volatility

It is because at Eid ul Adha Muslims required money to buy for slaughtering the cattle (Sunnat-e-Ibrahimi) instead to invest few days before in cattle business rather than equity market in the event of Zilhajj and Eid ul Adha. The cash flows turn down at the equity market and turn downs flow of funds and ultimately reduces return and volatility prior to this month. But our study is not in coherence with the studies of Shah et al. (2017), Bukhari et al. (2011) Zilhajj negative effect. However again a little downfall aroused in the month of Muharram as this month is also considered as grief month due to the event of Ashura in its early 10 days due to Shahadat Hazarat Imam Hussain (R.A).

However, the same bearish trend is followed by Safar, Rabi ul awwal and Rabi ul Sani. In a research Azimi et.al. (2012) indicated that the findings show that there is a level of significance in the months of Muharram and Safar and Stock Return. Rabi ul awwal is the month of happiness with reference to Islamic ideology and believe as well as Ramadan. Rabi ul awwal is happiness month from Islamic months due to the birth of Prophet (P.B.U.H) Eid ul Milad ul Nabi and month of grief due to Prophet (P.B.U.H) has passed away in this month. However in Jamadi ul awwal and Jamadi ul Sani show rise. Rajab got peaked and sharp fall Shaban but Ramadan remained positive.

The higher volatility is shown in the month of Ramadan, shawl and Zul Qa, ad and the lowest profile of volatility found in Rabi-ul-Awwal as also found by shah et al (2015) that returns were low volatility in the month of Rabi ul awwal but again there was a sharp rise in volatility from the month of Rabi ul Sani to Rajab. However, there was a decrease in volatility in Shaban.

The seasonal effects are presented in Table 2 and 3. It is clear that a dummy value found negative of (month) coefficient would be proof of Islamic calendar month. Whereas the estimation of the coefficient via Equation 1 is specifying that which months have lower average returns than those obtain in any Islamic month effect.

Table 2. Tests for Seasonal Effects for Islamic Calendar Anomaly

Variable	Pakistan		Bangladesh		Iran		Saudi Arabia	
	Coef	P-value	Coef	P-value	Coef	P-value	Coef	P-values
C	-0.014	0.913	0.001	0.046	-0.003	0.096	-0.000	0.664
Ramzan	0.098	0.506	-0.001	0.271	0.003	0.114	0.000	0.981
Shawal	-0.051	0.724	-0.001	0.111	0.003	0.150	-0.000	0.977
Zul Qa,ad	0.035	0.811	-0.001	0.087	0.005	0.020	0.001	0.443
Zilhajj	-0.001	0.991	-0.002	0.024	0.003	0.184	-0.000	0.852
Muharam	0.008	0.955	-0.002	0.040	0.003	0.110	0.002	0.197
Safar	0.128	0.389	-0.002	0.042	0.003	0.129	0.001	0.541
Rabi ul awwal	0.236	0.112	-0.001	0.167	0.004	0.056	0.002	0.306
Rabi ul sani	0.067	0.648	-0.002	0.025	0.003	0.097	0.000	0.829
Jamadi ul awwal	0.006	0.967	-0.000	0.686	0.002	0.323	0.000	0.826
Jamadi ul sani	0.037	0.803	-0.001	0.313	0.004	0.054	0.000	0.840
Rajab	0.0577	0.620	-0.000	0.258	0.002	0.133	0.000	0.992
Shaban	0.0571	0.701	-0.001	0.304	0.003	0.105	0.000	0.748
R-Square (OLS)	0.004		0.007		0.003		0.004	
D-W Test	1.669		1.676		2.078		1.543	
B-G Test	85.21 (0.000)		81.89(0.000)		0.3750 (0.977)		165.93(0.000)	

LM(1) Test	6.555 (0.000)	6.299(0.000)	4.8756(0.027)	12.76(0.000)
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Significant at $p < 0.05$

We used OLS process to identify the season effects, DW test, BG test, and LM (1) tests are used to test the serial autocorrelation and heterokedasy.

There are negative signs for Shawl and Zilhajj means a negative seasonal effect and coefficient for 10 months have positive signs including Muharram, Ramadan for Pakistan but no coefficient is significant even at $p < 0.10$.

However, Bangladesh has a negative seasonal impact for all the months and the coefficient for Zul Qa, ad is significant at $p < 0.10$ and Zilhajj, Muharram, Safar and Rabi ul Sani are significant at $p < 0.05$ level. For Iran all coefficients are positive except constant term and Zul Qa, ad and Rabi ul awwal are significant at ($p < 0.05$) and Rabi ul Sani is significant at ($p < 0.10$). Saudi Arabian markets show that months of Shawal, Zilhajj are behaving negatively and all positive coefficient for all other months but no one is significant at $p < 0.05$ level.

In Dubai, the seasonal effects show that only the coefficient for the month of Safar and all other months have negative coefficients but no one is significant at $p < 0.05$ level. Table 3 indicates that in Dubai the seasonal effects shows that only the coefficient for the month of Safar is negative and all other months have negative coefficients but not significant. The Egypt market indicates that only Zul Qa, ad and Zilhajj months have positive coefficients and other remain months have negative coefficients but no one is significant at $p < 0.05$.

Table 3. Tests for Seasonal Effects for Islamic Calendar Anomaly

Variable	Dubai		Egypt		Malaysia		Turkey	
	Coeft	P-value	Coeft	P-value	Coeft	P-value	Coeft	P-value
C	0.001	0.685	0.001	0.560	0.0000	0.9770	0.0010	0.514
Ramzan	-0.001	0.601	0.000	0.945	0.0001	0.8648	-0.0019	0.267
Shawal	-0.003	0.357	-0.001	0.506	0.0004	0.6016	-0.0002	0.882
Zul Qa,ad	-0.003	0.352	0.000	0.947	0.0001	0.9454	-0.0015	0.367
Zilhajj	-0.000	0.813	0.000	0.685	0.0004	0.6673	-0.0015	0.358
Muharam	-0.000	0.812	-0.000	0.907	0.0007	0.3821	0.0001	0.947
Safar	0.000	0.842	-0.002	0.187	0.0006	0.5114	-0.0014	0.397
Rabi ul awwal	-0.001	0.661	-0.002	0.269	0.0001	0.9374	-0.0011	0.509
Rabi ul sani	0.001	0.674	-0.000	0.946	-0.0002	0.8312	-0.0003	0.839
Jamadi ul awwal	-0.002	0.448	-0.000	0.895	-0.0004	0.6802	-0.0006	0.708
Jamadi ul sani	-0.001	0.615	-0.001	0.451	0.0004	0.6083	-0.0002	0.889
Rajab	-0.000	0.768	-0.000	0.678	0.0002	0.7758	0.0011	0.406
Shaban	-0.001	0.746	0.000	0.645	-0.0003	0.7335	-0.0012	0.479
R-Sqaure (OLS)	0.0031		0.005		0.0030		0.0051	
D-W Test	1.7896		1.6123		1.8899		1.7537	
B-G Test	34.058(0.0000)		118.17(0.0000)		1.658(0.0695)		46.75(0.0000)	
LM(1) Test	2.6198(0.0000)		9.0990(0.0000)		1.67(0.070)		3.5963(0.000012)	

Significant at $p < 0.05$

Malaysian markets indicate that only three months have negative coefficients and all other months have positive coefficients but no one is significant at $p < 0.05$. in Turkey the month of Rajab and Muharram have positive but all other months have negative but no one is significant at $p < 0.05$. From these results, we found significant seasonal effects regarding Iran and Bangladesh in the sample while we found also evidence in favor of the month effects Dubai, Egypt, Turkey and Malaysia and to some extent for Pakistan and Saudi Arabia as well.

Conclusion

This study is explored that Malaysia and Turkey moved together in Jamadi ul Sani to Zilhajj. However, in Ramadan, the behavior of the return remained positive but moved in negative direction immediately in Shawal. This phenomenon is reality because this element justified the existence of calendar anomaly. Muslim investor adopts bullish sentiments more in the Holy months and may lead to volatility. Syed and Khan (2017) also concluded that in Safar, Rabbi-ul-Awwal and Zil-hajj volatility in PSX market prevails but found no evidence of excessive or

abnormal returns in an Islamic month. Hence they concluded that no evidence of Islamic calendar anomaly in PSX. It is inferred that the seasonal effect of each month for each country that market is efficient except Iran and Bangladesh. We found also evidence in favor of the Islamic months' effects for Dubai, Egypt, Turkey, and Malaysia and to some extent for Pakistan and Saudi Arabia as well. Market Efficiency and the study Islamic calendar anomaly are more passionate against volatility and predictability of returns than the Gregorian Calnder because the Islamic calendar has rotation counts for different weathers and temperatures for the business effects and market dynamics whereas Gregorian calendar is static. The Islamic calendar anomaly or lunar effect is more practical and remarkable than any other fixed calendar. The study of Sonjaya and Wahyudi (2016) also concluded that Ramadan effect is presented in ten Islamic countries but not showing persistent behavior, however they identified that all marketers are not efficient. Our study also concluded that anomalous behavior is reality in long-run perspective in all Islamic economies and the average behavior is reflecting that markets have been inspired by the seasonal effects. Moreover it also concluded that there is a risk and return tradeoff at positive position. Here random movements negate reality and accept illusion. However, mean returns and volatility express reality. It is identified that the Gregorian Calander is static but the lunar calendar is dynamic and go across all the events and weathers. Weathers and temperatures may affect perception and psychology of investor. Finally it is concluded that investor psychology matters more than the price behavior and the issue is sub judicious to the subject of behavioral finance.

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