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RAMADAN EFFECT ON STOCK MARKETS*

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Abstract

The month of Ramadan is one the most renowned religious rituals in the world for more than 1.5 billion Muslims. This study analyzes the effect of religious experience during the Muslim holy days of Ramadan on the stock exchanges of 16 Muslim-majority countries. According to the results, among 16 countries, 13 Muslim financial markets have positive returns during Ramadan, which can be attributed to the generally positive investor mood or emotion. In contrast, only 4 stock markets—Dubai Financial Market, Amman Stock Exchange, Karachi Stock Exchange, and Tunis Stock Exchange—exhibit differences that are both positive and statistically significant. Moreover, the study divides the Muslim holy days into 3 periods, where the first period comprises the first 10 days of Ramadan, second period covers the next 10 days of the Ramadan month, and the final period involves the last 10 days. According to results, while the first 10 days witness the lowest performance, the last 10 days experience the highest performance.

Keywords: Ramadan Effect, Regression Analysis, Muslim Countries, Stock Markets

Öz

Ramazan ayı, dünyadaki 1,5 milyardan fazla Müslüman için en önemli dinsel ritüellerden biridir. Bu çalışma Ramazan ayının Müslümanların çoğunlukta olduğu 16 ülkenin menkul kıymetler borsası üzerindeki etkisini incelemektedir. Elde edilen sonuçlara göre, Ramazan ayının söz konusu 16 Müslüman ülkenin 13'ünde finans piyasası üzerinde olumlu etkisi görülmektedir ve bu etki genellikle pozitif yatırımcı ruh hali veya duygusu ile açıklanabilmektedir. Diğer taraftan, sadece Dubai, Ürdün, Pakistan ve Tunus Borsaları hem olumlu hem de istatistiksel olarak anlamlı farklılıklar göstermektedir. Ek olarak bu çalışma, Ramazan ayını; ilk on günü birinci dönem, ikinci on günü ikinci dönem ve son on günü üçüncü dönem olmak üzere üçe bölmüştür. Elde edilen sonuçlara göre, ilk on gün en düşük performans ile karşılaşılmakta, son on gün ise en yüksek performans gösterilmektedir.

Anahtar Kelimeler: Ramazan Etkisi, Regresyon Analizi, Müslüman Ülkeler, Borsalar

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1. Introduction

Ramadan is the ninth month of the Muslim *Hijri* calendar and is the month in which the Quran was revealed to Prophet Mohammad. Muslims worldwide observe Ramadan as a month of fasting; it is mandatory for Muslims to do so and is one of Islam's five pillars. During the fast, Muslims cannot eat or drink anything from dawn until sunset (Al-Ississ, 2009). Further, Muslims are urged to refrain from wrongdoing (Husain, 1998) and are encouraged to devote themselves to acts of piety, prayers, and charity (Seyyed, 2005). Muslims are focused more on praying, reciting the Quran, and giving alms from their previous year's earnings. As a fundamental practice of the Islamic faith, Ramadan brings about a greater solidarity and collaboration between Muslims. Its main contribution is the greater social support that provides to the society as well as the close relationship an individual Muslim establishes with Allah (Białkowski, et. al, 2012).

Faith plays a very important function in decision-making and the actions of the people. Religious values and practices have an important effect on economic growth (Weber, 1930). According to a study on positive psychology, religion provides a valuable form of social support, inspires optimistic beliefs, and contributes to believers' happiness (Beit-Hallahmi & Argyle, 1997). In Islamic countries, although the act of fasting during Ramadan means that Muslims spend the first half of the day feeling hungry, which expected to have a negative influence on investor mood, the contrary happens. According to religious beliefs, this is a holy month and investors generally feel better when they are trading during Ramadan (Al-Hajieh, 2011).

To mark the end of Ramadan, Muslims celebrate Eid-ul-Fitr *(Ramadan Feast)*. *Eid* is the Arabic word for festivity and Eid-ul-Fitr means breakfast, so it symbolizes breaking of the fasting period. Eid-ul Fitr comprises the final three days of Ramadan. It is a time to celebrate the completion of a month of blessing and joy with family and friends (Al-Hajieh, 2011). In addition, there is also a sharp increase in prices especially in food, clothes, and commodities before the Eid celebration because people purchase them for the feast. After the celebration, prices revert to their original ones (Alrashidi, 2014). Most Islamic countries use both Gregorian and Islamic lunar calendars. The Islamic calendar is predominantly used for religious activities, whereas the Gregorian calendar is used for business and government purposes. According to the lunar calendar, Ramadan steps back each year in order to start about 10 days earlier. Thus, the month of Ramadan presents an opportunity to test and determine any predictable patterns in the behavior of stock returns and the volatility relative to other months of the year (Iqbal, 2013). Stock markets remain open during the Ramadan days that are observed by an overwhelming majority of the Muslim population. (Al-Ississ, 2015). First, this study tries to analyze the Ramadan effect on stock exchanges of 16 Muslim countries using a regression analysis method. Second, the Ramadan effect is analyzed in 3 segments, each consisting of 10 days of Ramadan month, in order to see whether investors display different attitudes during Ramadan. The remainder of this paper is organized as follows: Section 2 presents a literature review about this topic. Section 3 outlines the data and methodology. Section 4 discusses the empirical results, and Section 5 concludes this study.

2. Literature Review

Husain (1998) explored the Ramadan effect on Karachi Stock Exchange covering the period from January 1989 to December 1993. The data consist of 36 individual stocks, 8 sector indices and the general market index. It can be concluded that the Ramadan does not significantly effect on the average return in the market; however, there is a strong evidence of a substantial decline in the volatility of stock returns. Frieder and Subrahmanyam (2004) analyzed the impact of the Christian holiday of St. Patrick's Day and the Jewish holy days of Rosh Hashanah and Yom Kippur on the U.S. equity markets over the 1946–2000 period. They found that stock returns were significantly higher on Rosh Hashanah but significantly lower on Yom Kippur days. For most holy days, trading volumes decline. Seyyed, Abraham, and Al-Haiji (2005) analyzed the Saudi Stock Exchange during the Ramadan periods. They analyzed different sector indices in the market. According to their finding, volatility and trading activity vanished significantly during Ramadan in Saudi Stock Exchange. Al-Ississ (2010) examined the effect of faith on the financial markets of 17 countries during the period between 1988 and 2008. He found that Ramadan has a statistically significant positive effect on the returns of financial markets. On the other hand, Ramadan dropped the trading volume of financial markets.

Al-Hajieh, Redhead, and Rodgers (2011) investigated the Ramadan effect in Turkey, Jordan, Egypt, Kuwait, and Saudi Arabia during the period from January 1992 to December 2007. According to results, except for Saudi Arabia and Bahrain, average daily returns during Ramadan are both statistically significant and higher than the average returns of other months in the year. Furthermore, high volatility levels can be seen for all countries both at the beginning and end of the Ramadan. Białkowski, Etebari & Wisniewski (2012) examined the 14 predominantly Muslim countries over the 1989–2007 period. Their results revealed that Ramadan stock returns are higher than other days but are less volatile compared to the rest of the year. No obvious declines in market liquidity can be observed during this festive season. Moreover, Ramadan has a positive impact on investors' mood and sentiment.

Ramezani, Pouraghajan, Mardani (2013) investigated the impact of lunar months on Tehran Stock Exchange during the period of 2002-2012. They found that there is a positive and significant relationship between Ramadan and Tehran stock exchange. Iqbal, Kouser and Azeem (2013) considered the Ramadan effect on Karachi Stock Exchange during the period of 1992 to 2011. The results indicate that there is a significant reduction in volatility of return, but the Ramadan effect is significant at 10% level. Shah and Ahmed (2014) investigated the Ramadan effect in the context of the Karachi Stock Exchange between January 2010 and December 2012; they found that religion factors are not associated with financial markets, as the market remains the same during Ramadan as at any other month of the year. In accordance, they found that the Ramadan effect is not significant in the Karachi Stock Exchange. Alatiyat (2014) analyzed the 19 listed banks in Abu Dhabi Security Exchange (ADX) and Dubai Financial Market (DFM) during the periods of 2008 – 2013. The average returns for banks in ADX and DFM in Ramadan are less than the usual average in the period. The study also found that the Islamic banks stocks increase during the Ramadan period, thus it is profitable to buy those stocks before Ramadan and sell them in the Ramadan.

3. Methodology and Data

This study estimates the impact of Ramadan on financial markets by running OLS regression analysis. Stock returns are analyzed using a logarithmic return. The advantage in looking at the log returns of a series is that one can see relative changes in the variable and compare these directly with other variables whose values may have very different base values. The following regression analysis is estimated to analyze the impact of faith on financial markets

$$R_{i,t,j} = \beta_0 + \beta_1 \text{Ramadan\_Effect}_{t,j} + \varepsilon_t$$

where;

β_0 = regression intercept coefficient

β_1 = regression slope coefficient

$R_{i,t,j}$ = the logarithmic daily return of stock exchange (i) on day (t) in country (j)

$\text{Ramadan Effect}_{t,j}$ = a dummy variable that takes the value (1) if day (t) is part of Ramadan days in country (j) and (0) otherwise

ε_t = Random error term

Moreover, the study divides Ramadan into three 10-day periods covering the 30-day period of Ramadan. This division is useful because although Ramadan is a continuous 29 or 30 days duration, the intensity of worship, features, and promised rewards vary.

"This a month (Ramadan), the first part of which brings Allah's Mercy, the middle of which brings Allah's forgiveness and the last part of which brings emancipation from hellfire" (Hadith in Sahih Al-Bukhari).

The first 10 days of Ramadan are the hardest ones because it is physically difficult to adjust to a new dietary schedule and nutritional deprivation during the day. Therefore, during the first 10-day period, Ramadan is expected to be dominated by the physical impact of fasting rather than mystical experiences (Al-Ississ, 2010).

Moreover, the last 10 days of Ramadan are the most blessed part, as they include Laylat Al-Qadar—*The Night of Decree is better than a thousand months*—when the Quran was first revealed to the prophet Mohammad. The following regression analysis is computed to find whether differences exist between these three segments:

$$R_{i,t,j} = \beta_0 + \beta_1 \text{RamadanDays1\_10}_{t,j} + \beta_2 \text{RamadanDays11\_20}_{t,j} + \beta_3 \text{RamadanDays21 \_30}_{t,j} + \varepsilon_t$$

where

$R_{i,t,j}$ = the logarithmic daily return of stock exchange *i* on day *t* from the trading day before in country *j*;

$RamadanDays1\_10_{t,j}$ = a dummy variable that takes the value of 1 if day *t* fall on days 1–10 of Ramadan in country *j*;

$RamadanDays11\_20_{t,j}$ = a dummy variable that takes the value of 1 if day *t* fall on days 11–20 of Ramadan in country *j*; and

$RamadanDays21\_30_{t,j}$ = a dummy variable that takes the value of 1 if day *t* fall on days 21–30 of Ramadan in country *j*.

ε_t = Random error term

This study examines the stock exchanges of 16 countries to determine if a Ramadan effect could be observed in Table 1. All stock exchange data is obtained from the Thomson Reuters DataStream database. The time zone of the Indonesia Stock Exchange, Amman Stock Exchange, Dhaka Stock Exchange, Bursa Malaysia, Karachi Stock Exchange, and Borsa Istanbul have longer data ranging from January 1990 to August 2015. In contrast, data for Dubai Financial Market is available from January 2004 to August 2015. However, at least 10 years of Ramadan data is available for this stock exchange, and it is sufficient to include the sample in the study. Since data for Iran is not available with Thomson Reuters, Tehran Stock Exchange could not be included in this study. Also, instead of Abu Dhabi Stock Exchange, Dubai Financial Market's data is used for this study.

Table 1. ***List of Stock Exchanges***

Country	List of Stock Exchanges	Starting Date	Ending Date	Obs. Days
Bahrain	Bahrain Stock Exchange	02.01.2003	31.08.2015	3302
Bangladesh	Dhaka Stock Exchange	01.01.1990	31.08.2015	6695
Abu Dhabi (Dubai)	Dubai Financial Market	02.01.2004	31.08.2015	3042
Egypt	Egyptian Exchange	02.01.1995	31.08.2015	5390
Indonesia	Jakarta Stock Exchange	02.01.1990	31.08.2015	6695
Jordan	Amman Stock Exchange	02.01.1990	31.08.2015	6695
Kuwait	Kuwait Stock Exchange	03.01.2000	31.08.2015	4086
Lebanon	Beirut Stock Exchange	01.02.1996	31.08.2015	5108
Malaysia	Bursa Malaysia	02.01.1990	31.08.2015	6695
Morocco	Casablanca Stock Exchange	02.01.2002	31.08.2015	3563
Oman	Muscat Securities Market	01.11.1996	31.08.2015	4912
Pakistan	Karachi Stock Exchange	02.01.1990	31.08.2015	6695
Qatar	Qatar Stock Exchange	01.09.1998	31.08.2015	4436
Saudi Arabia	Saudi Stock Exchange	02.11.1998	31.08.2015	4392
Tunisia	Tunis Stock Exchange	02.01.1998	31.08.2015	4607
Turkey	Borsa Istanbul	02.01.1990	31.08.2015	6695

Furthermore, countries are selected if the proportion of population professing the Muslim faith exceeded 50%. Among these countries, Indonesia has the highest population of over 250 million people, whereas Bahrain has the lowest population of approximately 1.4 million people. In total, there are approximately 885 million Muslims living in these countries. According to the percentage of the Muslim population within the selected countries, while Saudi Arabia has the highest ratio with 100%, Jordan has the lowest ratio with 54%. Islam has two denominations: *Sunni* and *Shia*. Of the included countries, Bahrain has a mostly Shia population, and in Lebanon, the Shia and Sunni ratio is equal. Other countries mostly have a Sunni population. Islamic holy days follow the Hijri calendar, not Gregorian year, and the Muslim Hijri year is 11 days shorter than the Gregorian calendar year. Each Muslim country follows an independent and often different method to calculate the start of each lunar month. Countries can use astronomical calculations but differentiate between the required parameters. Hence, the first day of Ramadan varies from country to country in the same year. Due to these differences, starting date data is collected from different websites in order to determine the correct Ramadan start and end days for each country.

Table 2. Population of Muslim Majority Countries

Country	Population (2014) (million)	Percent Muslim (%)	Denomination	Share of World Pop.
Indonesia	252.812,25	87,20%	Sunni	3,49%
Pakistan	185.132,93	96,40%	Sunni	2,56%
Bangladesh	158.512,57	89,10%	Sunni	2,19%
Egypt	83.386,74	90%	Sunni	1,15%
Turkey	75.837,02	99,80%	Sunni	1,05%
Morocco	33.492,91	99%	Sunni	0,46%
Malaysia	30.187,90	61,30%	Sunni	0,42%
Saudi Arabia	29.369,43	100%	Sunni	0,41%
Tunisia	11.116,90	99,10%	Sunni	0,15%
Jordan	7.504,81	97,20%	Sunni	0,10%
Lebanon	4.965,91	54%	Sunni-Shia	0,70%
Oman	3.926,49	85,90%	Sunni	0,50%
Kuwait	3.479,37	76,70%	Sunni	0,50%
United Arab Emirates (Dubai)	2.327,00	76%	Sunni	0,32%
Qatar	2.267,92	77,50%	Sunni	0,30%
Bahrain	1.344,11	70,30%	Shia	0,20%

Source: http://www.worldometers.info/world-population/population-by-country/ and https://www.cia.gov/library/publications/the-world-factbook/fields/2122.html

4. Empirical Results

Figures 1, 2, and 3 **(as seen in Appendix A)** depict the time series evolution of the 16 different indexes considered in this study. Figure 1 shows the price index of the countries according to their time period of Ramadan observance. Figure 2 reports the daily returns of the respective stock exchanges excluding Ramadan days, and finally, Figure 3 presents stock returns on Ramadan days. Additionally, figure 3 provides a clear picture of the presence of volatility clusters.

Table 3 provides descriptive statistics of stock returns excluding Ramadan days. The average columns indicate stock market returns. Borsa Istanbul has the highest returns, whereas the Beirut Stock Exchange has the lowest returns. Except for Lebanon, all markets have positive returns in the duration of the study period. The standard deviation column indicates the stock market volatility. Qatar Stock Exchange has the highest range of maximum and minimum returns; it also has the highest standard deviation. The skew column displays the skew of stock markets. Except for Bursa Malaysia and Muscat Securities Markets, all examined stock markets have a negative skew. All stock markets have positive kurtosis, which implies typical heavy-tailed financial distributions.

Table 3. Descriptive Statistics of Excluding Ramadan Days

Stock Exchanges	Mean	Std.dev.	Min	Max	Skew	Kurtosis
Bahrain Stock Exchange	0,0001	0,0057	-0,0492	0,0361	-0,4467	9,7848
Dhaka Stock Exchange	0,0003	0,0157	-0,2691	0,1918	-1,0368	47,7065
Dubai Financial Market	0,0002	0,0186	-0,1216	0,122	-0,1336	8,7125
Egyptian Exchange	0,0003	0,0147	-0,172	0,1192	-0,4689	12,1307
Jakarta Stock Exchange	0,0003	0,0145	-0,1095	0,1313	-0,0669	12,1369
Amman Stock Exchange	0,0002	0,0099	-0,2054	0,1987	-0,1979	66,098
Kuwait Stock Exchange	0,0003	0,0088	-0,0933	0,063	-0,8822	15,725
Beirut Stock Exchange	-0,0001	0,0117	-0,3283	-0,3283	-4,5816	143,2373
Bursa Malaysia	0,0002	0,013	-0,2415	0,2082	0,3462	56,4978
Casablanca Stock Exchange	0,0003	0,0076	-0,0682	0,0446	-0,5269	10,0345
Muscat Securities Market	0,0002	0,011	-0,1484	0,1986	0,3027	47,3722
Karachi Stock Exchange	0,0005	0,0146	-0,1321	0,1276	-0,2501	9,8208
Qatar Stock Exchange	0,0004	0,0256	-0,8581	0,8447	-0,5314	613,068
Saudi Stock Exchange	0,0004	0,015	-0,1168	0,164	-0,6025	16,7451
Tunis Stock Exchange	0,0003	0,0054	-0,05	0,0462	-0,1033	16,0194
Borsa Istanbul	0,0011	0,0253	-0,1998	0,1564	-0,204	7,3466

Table 4 provides descriptive statistics of market returns only for Ramadan. Qatar Stock Exchange has the highest average during Ramadan, while Bursa Malaysia has the lowest returns. Dhaka Stock Exchange has the highest standard deviation, which is related to the range of maximum and minimum returns. While 6 markets have a positive skew, the other 10 have a negative skew. All markets have positive kurtosis, which indicate heavy-tailed financial distributions. During Ramadan days, stock market returns in Bahrain, Malaysia, Morocco, and Lebanon have negative average

returns. However, market returns in Bangladesh, Dubai, Egypt, Pakistan, Jordan, Kuwait, Indonesia, Qatar, Saudi Arabia, Tunisia, and Turkey are higher during Ramadan compared with non-Ramadan months. The results indicate that Ramadan has a positive impact on stock prices. To the extent that it contributes to investors' positive mood and they might have a tendency to invest. If a person is in a good mood, he/she will have a tendency to be optimistic while evaluating an investment. Good moods may motivate investors to invest in risky financial instruments like stocks rather than bonds (Al-Hajieh, 2011). Nofsinger (2002) suggests an optimism bias. Optimistic thinking reduces critical analysis during the investment process and investors might ignore pessimistic information.

Table 4. Descriptive Statistics of Ramadan Days

	Mean	Std.dev.	Min	Max	Skew	Kurtosis
Bahrain Stock Exchange	-0,0001	0,0042	-0,0233	0,0156	-1,1668	9,3359
Dhaka Stock Exchange	0,0043	0,0828	-0,8652	0,9341	3,3068	76,9408
Dubai Financial Market	0,0017	0,018	-0,1479	0,0941	-1,7645	23,7255
Egyptian Exchange	0,0011	0,0301	-0,1792	0,5232	9,729	190,5292
Jakarta Stock Exchange	0,0002	0,0266	-0,5471	0,1047	-14,3577	298,5525
Amman Stock Exchange	0,0008	0,0103	-0,0973	0,087	-0,6989	40,663
Kuwait Stock Exchange	0,0009	0,01196	-0,05649	0,19082	10,6948	177,8994
Beirut Stock Exchange	-0,0002	0,0137	-0,2179	0,0642	-8,0944	137,6212
Bursa Malaysia	-0,0006	0,0329	-0,7453	0,1294	-18,9568	434,7307
Casablanca Stock Exchange	-0,0002	0,008	-0,0417	0,0425	-0,203	11,464
Muscat Securities Market	0,0001	0,0144	-0,2288	0,0423	-9,7518	152,6064
Karachi Stock Exchange	0,0036	0,0323	-0,0999	0,7123	17,7363	383,9675
Qatar Stock Exchange	0,0059	0,0636	-0,478	0,7746	4,9236	75,853
Saudi Stock Exchange	0,0004	0,0118	-0,0672	0,0644	-0,9461	12,2353
Tunis Stock Exchange	0,0008	0,0041	-0,0216	0,021	-0,1311	7,8807
Borsa Istanbul	0,003	0,0363	-0,1143	0,4825	4,306	55,7791

Table 5 provides the correlation of market returns excluding Ramadan days. Malaysia and Indonesia are the most correlated markets, which likely reflects their physical proximity, being neighbors, as well as on their financial integration. However, correlations between other countries are very low, so it can be concluded that there is scant financial integration among most Muslim-majority countries during non-Ramadan days. Morocco and Bahrain have the lowest correlation. Table 6 shows the correlation of market returns for Ramadan days. Malaysia and Indonesia are most correlated at 83.8%. Also, the financial market of (1) Qatar and Bangladesh, (2) Indonesia and Morocco, and (3) Qatar and Dubai highly correlate with each other during Ramadan days. The comparison of Ramadan and non-Ramadan months reveals that correlations for Ramadan days are higher than other days. In Table 6, correlation results are mostly negative; however, correlations for Ramadan days are mostly positive, therefore it can be concluded that the financial markets of Muslim countries might move to the same trend during Ramadan as investors might have the same mood, i.e., happiness and optimism caused by Ramadan itself.

Table 5. Correlation Coefficients Matrix (Excluding Ramadan Days)

	BAH	BAN	DUB	EGYPT	IND	JOR	KUW	LEB	MAL	MOR	OMAN	PAK	QATAR	S.A.	TUN	TUR
Bahrain	1															
Bangladesh	0,0031	1														
Dubai	-0,0071	-0,0136	1													
Egypt	-0,0022	-0,0183	0,0052	1												
Indonesia	-0,0313	0,0363	-0,0051	-0,0035	1											
Jordan	-0,0118	-0,0244	-0,0008	-0,0060	-0,0035	1										
Kuwait	0,0272	0,0041	0,0009	-0,0046	-0,0156	0,0271	1									
Lebanon	-0,0230	-0,0241	-0,0264	-0,0237	0,0198	-0,0126	-0,0116	1								
Malaysia	0,0058	0,0113	-0,0049	-0,0298	0,2928	-0,0006	-0,0115	0,0088	1							
Morocco	-0,0363	0,0280	-0,0191	0,0291	-0,0009	-0,0068	-0,0079	-0,0333	-0,0324	1						
Oman	-0,0157	-0,0022	-0,0100	-0,0065	-0,0143	-0,0213	-0,0100	0,0039	0,0009	-0,0346	1					
Pakistan	0,0177	0,0187	0,0047	-0,0026	0,0743	0,0249	0,0056	-0,0095	0,0698	-0,0129	-0,0199	1				
Qatar	0,0097	-0,0019	-0,0167	0,0009	-0,0054	0,0089	0,0210	0,0007	0,0068	0,0053	0,0055	-0,0035	1			
S. Arabia	-0,0246	-0,0339	0,0011	-0,0172	0,0299	-0,0110	-0,0117	0,0174	-0,0164	0,0047	-0,0138	0,0086	-0,0045	1		
Tunisia	0,0050	-0,0213	-0,0150	0,0030	-0,0160	0,0023	-0,0076	-0,0209	-0,0190	-0,0109	0,0007	-0,0105	0,0051	0,0002	1	
Turkey	-0,0096	-0,0043	-0,0098	-0,0189	0,0126	0,0025	0,0252	0,0068	0,0126	-0,0139	0,0127	0,0244	0,0386	0,0070	-0,0261	1

Table 6. Correlation Coefficients Matrix (Ramadan Days)

	BAH	BAN	DUB	EGYPT	IND	JOR	KUW	LEB	MAL	MOR	OMAN	PAK		S.A.	TUN	TUR
Bahrain	1															
Bangladesh	0,0147	1														
Dubai	-0,1086	0,0116	1													
Egypt	0,0686	0,0232	0,0520	1												
Indonesia	-0,0537	0,0165	0,0211	0,0231	1											
Jordan	0,0233	-0,0318	0,0222	-0,0353	-0,0410	1										
Kuwait	0,0066	0,0151	0,0424	-0,0034	-0,0723	0,0593	1									
Lebanon	-0,0391	-0,0064	-0,0027	0,0092	-0,0089	-0,0098	-0,0003	1								
Malaysia	-0,0067	-0,0007	0,0673	-0,0327	0,8379	0,0033	-0,0183	0,0048	1							
Morocco	-0,0542	0,0859	0,0935	-0,0150	-0,0002	0,0160	-0,0237	0,0329		1						
Oman	0,1246	-0,0191	0,0346	-0,2308	0,0020	-0,0177	0,0398	0,0434	0,0329	-0,0431	1					
Pakistan	0,0085	-0,0810	-0,0021	-0,0020	-0,0109	-0,0141	0,0512	0,0381	0,0011	-0,0104	-0,0144	1				
Qatar	-0,0749	0,2239	0,1517	0,0070	0,0181	0,0094	0,0032	-0,0345	0,0096	0,1695	0,0200	0,0226	1			
S. Arabia	-0,0315	-0,0140	0,0367	0,0254	-0,0306	0,0633	0,0176	0,0324	0,0102	0,0805	0,0609	0,0332	0,0694	1		
Tunisia	0,0098	0,0643	-0,0222	-0,0639	0,0548	-0,0105	0,0151	-0,0066	0,0664	-0,0129	0,0167	0,0042	0,0158	-0,0384	1	
Turkey	-0,0144	0,0774	-0,0365	0,0092	-0,0150	0,0101	0,0666	0,0342	0,0157	0,0650	-0,0055	0,0519	0,0098	-0,0257	0,0829	1

Table 7 displays the regression analysis of the Ramadan effect on stock markets. According to the results, Ramadan's effect on the Bahrain Stock Exchange, Bursa Malaysia, and Casablanca Stock Exchange are negative but statistically insignificant. This shows that Malaysian society is a devoted Islamic society and members of Malaysian society are less actively involved in corporeal pursuits and spend increasingly more time in prayers during this holy month. Malaysian society might be called closer to Islamic practices (Akhter, et. al, 2015). The same might apply to the Moroccan society as well. However, negative results found for Bahrain might, however, reflect the country's religious and cultural differences. Whereas the other countries included in this study are mostly Sunni, Bahrain's population is mostly Shia. Ramadan is important in Bahrain, but Shias also focus on the rituals of grieving and martyrdom associated with the death of Ali ibn Abi Talib and the loss of his sons Hussein and Hassan. Due to these events, a less positive social mood might be exhibited (Al-Hajieh, 2011). Among the 16 countries studied, 13 Muslim financial markets exhibit positive returns during Ramadan. This finding might be attributed to the generally positive investor mood or sentiment. The Dubai Financial Market, Amman Stock Exchange, and Tunis Stock Exchange show statistically significant differences between Ramadan and non-Ramadan periods at 10%. The Karachi Stock Exchange is statistically significant at 1%. Therefore, it can be concluded that Ramadan exerts an overall, direct positive effect on stock exchanges of Muslim countries.

Table 7. Regression Results of Ramadan Effect

Bahrain Stock Exchange	*Coef*	-0,00022	Bursa Malaysia	-0,00012
	t-stat	(-0,62749)		(-0,21885)
Dhaka Stock Exchange	*Coef*	0,00028	Casablanca Stock Exchange	-0,00047
	t-stat	(0,4184)		(-1,01749)
*Dubai Financial Market**	*Coef*	*0,00213*	Muscat Securities Market	0,00059
	t-stat	*(1,7677)*		(1,0761)
Egyptian Exchange	*Coef*	0,00053	*Karachi Stock Exchange****	0,00163
	t-stat	(0,7532)		(2,60881)
Jakarta Stock Exchange	*Coef*	0,00085	Qatar Stock Exchange	0,000426
	t-stat	(1,35828)		(0,3215)
*Amman Stock Exchange**	*Coef*	*0,00074*	Saudi Stock Exchange	0,00002
	t-stat	*(1,72616)*		(0,02802)
Kuwait Stock Exchange	*Coef*	0,000207	*Tunis Stock Exchange**	0,00049
	t-stat	(0,42653)		(1,78424)
Beirut Stock Exchange	*Coef*	0,00028	Borsa Istanbul	0,00115
	t-stat	(0,46143)		(1,0217)

Significance Level: * indicates 10%, ** indicates 5%, *** indicates 1%

Table 8 shows the Ramadan effect divided into the three periods as discussed earlier. According to these results, for the first 10 days, the Ramadan effect is negative for Bahrain, Bangladesh, Egypt, Indonesia, Jordan, Kuwait, Lebanon, Malaysia, Morocco, Oman, Qatar, and Saudi Arabia. These results are consistent with our argument for the first days of Ramadan being

the hardest for adherents because the need to adjust to fasting during the earlier days might overshadow the positive emotions aroused by the holy period. In contrast, during this first period, only the Turkish stock market shows positive returns, which is statistically significant at 10%. Results for the last 10 days of Ramadan are positive for all countries apart from Malaysia. The findings for the stock markets of Bangladesh and Tunisia are statistically significant at 10%; findings for Dubai, Egypt, Jordan, and Oman are statistically significant at 5% and results for Pakistan's stock market are statistically significant at 1%, so these results are also consistent with our assertion. The last 10 days of Ramadan are the most blessed part, as they include *Laylat Al-Qadar* and the period when the Quran being first revealed to Prophet Mohammad. In addition, the third period is also leads to *Eid-ul-Fitr.* During this time, people purchase gifts, clothes, and food commodities for the feast. It is the time to celebrate the completion of a month of blessing with family and friends. For the second period of Ramadan, the findings for the stock markets of Malaysia and Jordan are both positive and statistically significant at 10%. Interestingly, returns on the Bursa Malaysia are negative for both the first and last 10 days of Ramadan; however, its returns are both positive and statistically significant for the 10 days in the middle of Ramadan.

Table 8. Regression Results of Ramadan 1-10, Ramadan 11-20, Ramadan 21-30

Stock Markets		**RAMADAN 1_10**	**RAMADAN 11_20**	**RAMADAN 21_30**
Bahrain Stock Exchange	*Coef*	-0,00069	-0,000088	0,0001
	t-stat	(-1,17823)	(-0,14847)	(0,18569)
Dhaka Stock Exchange	*Coef*	-0,00028	-0,00084	***0,001999****
	t-stat	(-0,24996)	(-0,73677)	***(1,73479)***
Dubai Financial Market	*Coef*	0,00101	0,00129	***0,00419****
	t-stat	(0,50441)	(0,64031)	***(2,02931)***
Egyptian Exchange	*Coef*	-0,00144	0,00046	***0,00259****
	t-stat	(-1,21384)	(0,38804)	***(2,17554)***
Jakarta Stock Exchange	*Coef*	-0,00061	***0,00256****	0,00066
	t-stat	(-0,58196)	***(2,40188)***	(0,61976)
Amman Stock Exchange	*Coef*	-0,00056	***0,0012****	***0,00168****
	t-stat	(-0,78815)	***(1,66659)***	***(2,25308)***
Kuwait Stock Exchange	*Coef*	-0,0001	-0,00005	0,00073
	t-stat	(-0,12461)	(-0,05967)	(0,92018)
Beirut Stock Exchange	*Coef*	-0,00087	0,00105	0,0007
	t-stat	(-0,8904)	(1,06652)	(0,70932)

Bursa Malaysia	*Coef*	-0,00102	***0,00157****	-0,00088
	t-stat	(-1,1036)	***(1,66816)***	(-0,94261)
Casablanca Stock Exchange	*Coef*	-0,00108	-0,00051	0,00019
	t-stat	(-1,40582)	(-0,65176)	(0,24607)
Muscat Securities Market	*Coef*	-0,00095	0,00066	***0,00206****
	t-stat	(-1,03414)	(0,71925)	***(2,23691)***
Karachi Stock Exchange	*Coef*	0,0005	0,00125	***0,003175*****
	t-stat	(0,47867)	(1,17853)	***(-3,00809)***
Qatar Stock Exchange	*Coef*	-0,00102	0,00155	0,00002
	t-stat	(-0,48938)	(0,71372)	(0,01092)
Saudi Stock Exchange	*Coef*	-0,00168	-0,00031	0,00036
	t-stat	(-1,28506)	(-0,23494)	(-1,49777)
Tunis Stock Exchange	*Coef*	0,000464	0,000173	***0,000839****
	t-stat	(-1,01824)	(0,37293)	***(-1,79813)***
Borsa Istanbul	*Coef*	***0,00343****	-0,00006	0,00001
	t-stat	***(1,80792)***	(-0,02895)	(0,00625)

Significance Level: * indicates 10%, ** indicates 5% indicates 1%.***

5. Conclusion

The month of Ramadan is one the most renowned religious rituals in the world for more than 1.5 billion Muslims. Muslims alter many aspects of their behavior during the month of Ramadan. Their working patterns change and they are focused more on praying, reciting the Quran, and giving alms from their previous year's earnings. These practices bring about greater solidarity and collaboration between Muslims. This study analyzes the effect of Ramadan on the stock exchanges of 16 Muslim countries.

According to the results of the regression analysis, the Ramadan effect is negative but statistically insignificant for the Bahrain Stock Exchange, Bursa Malaysia, and Casablanca Stock Exchange. Among the 16 countries studied, 13 Muslim financial markets have positive returns during Ramadan, which can be attributed to the generally positive investor mood or emotions. The differences in returns on the Dubai Financial Market, Amman Stock Exchange, and Tunis Stock Exchange are statistically significant at 10%, while it is statistically significant for the Karachi Stock Exchange at 1%. It can, therefore, be concluded that Ramadan exerts a direct positive effect on stock exchanges in the countries studied. These results are consistent with the previous studies of (Al-Ississ, 2010; Al-Hajieh, Redhead, and Rodgers, 2011; Białkowski, Etebari & Wisniewski, 2012).

Furthermore, this study splits the Muslim holy days into 3 periods, where the first period includes the first 10 days of Ramadan, second period covers the next 10 days of the Ramadan month, and

the final period comprises the last 10 days. According to results, while the first 10 days witness the lowest performance, the last 10 days experience the highest performance. These results are also coherent with the study of Al-Ississ (2010). This study can be extended by applying volatility analysis of stock markets in order compare with Ramadan and non-Ramadan days. Also, because of missing data of Iran during the study, it couldn't consider in this study, however, because of the importance place of Iran within Muslim society, Tehran stock exchange should be considered into the study.

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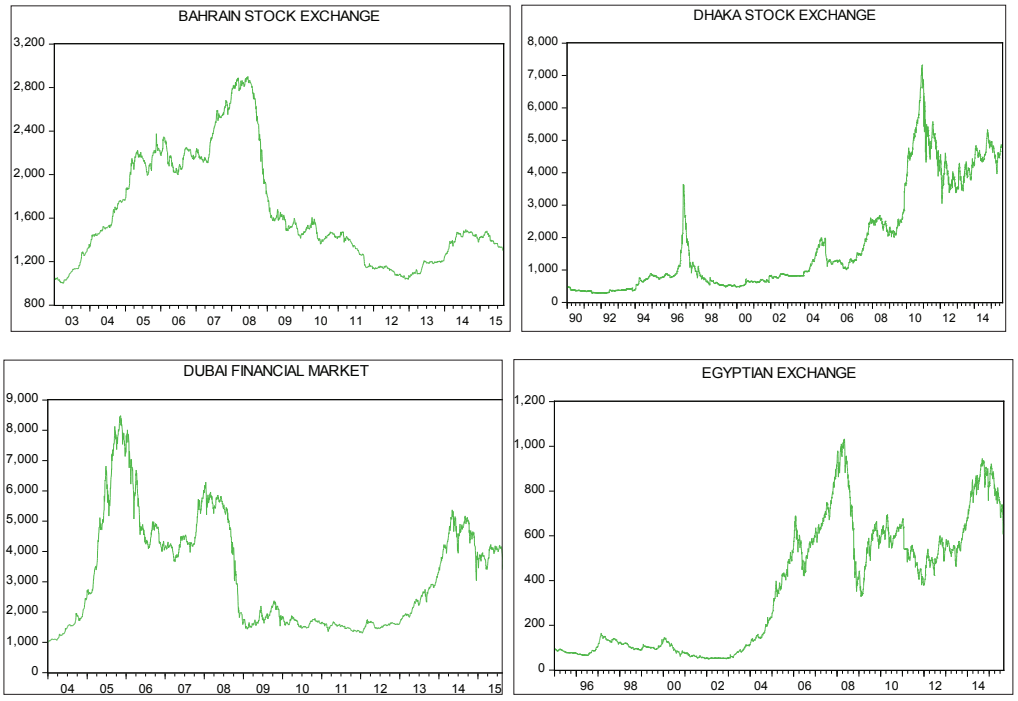
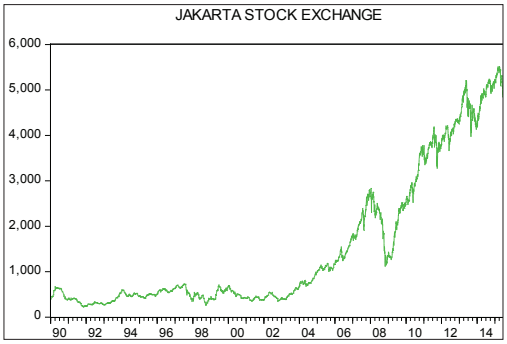
APPENDIX B: FIGURES

Figure 1: Price Index of 16 Countries




JAKARTA STOCK EXCHANGE
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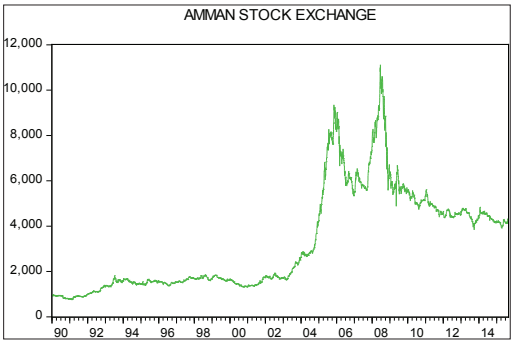
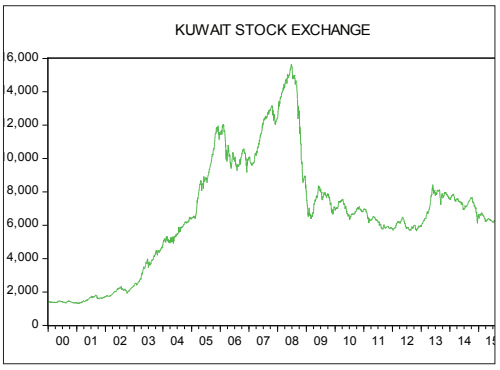
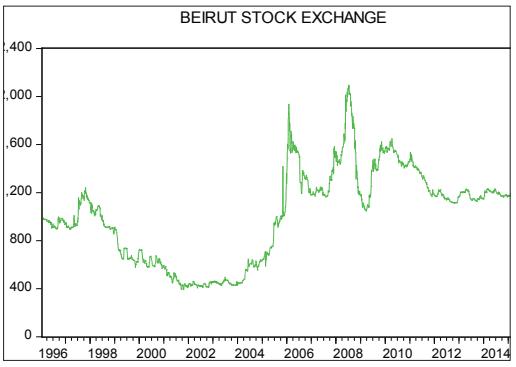
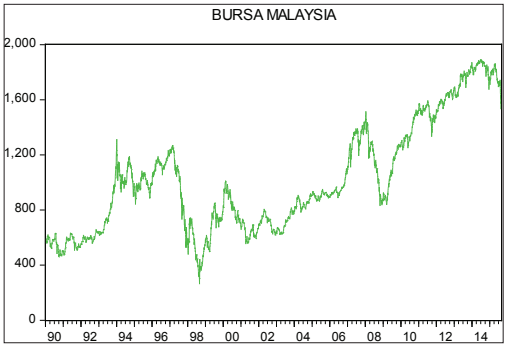
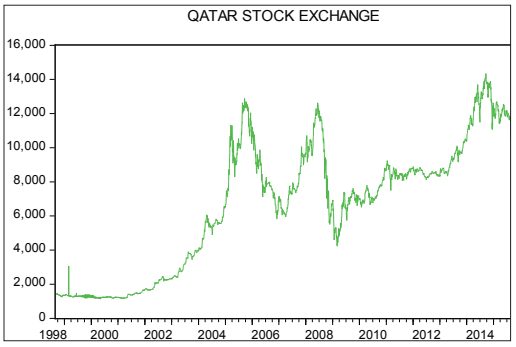
5,000
4,000
3,000
2,000
1,000
0
90 92 94 96 98 00 02 04 06 08 10 12 14

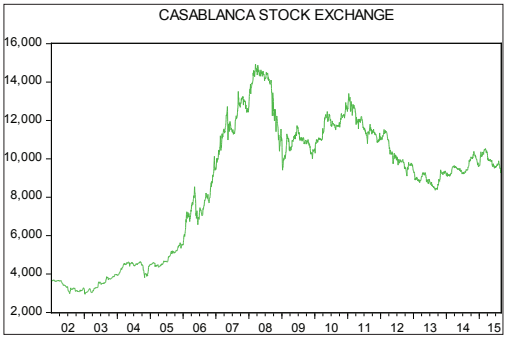

AMMAN STOCK EXCHANGE
12,000
10,000
8,000
6,000
4,000
2,000
0
90 92 94 96 98 00 02 04 06 08 10 12 14

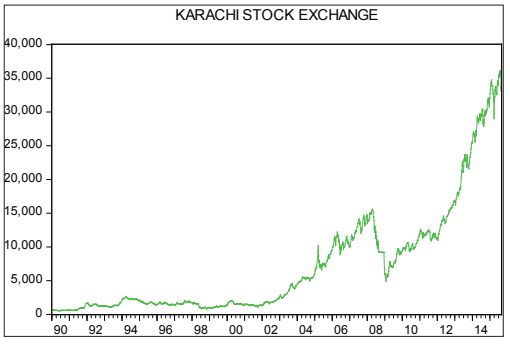

KUWAIT STOCK EXCHANGE
6,000
4,000
2,000
0,000
8,000
6,000
4,000
2,000
0
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15


BEIRUT STOCK EXCHANGE
,400
,000
,600
,200
800
400
0
1996 1998 2000 2002 2004 2006 2008 2010 2012 2014


BURSA MALAYSIA
2,000
1,600
1,200
800
400
0
90 92 94 96 98 00 02 04 06 08 10 12 14


QATAR STOCK EXCHANGE
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1998 2000 2002 2004 2006 2008 2010 2012 2014


CASABLANCA STOCK EXCHANGE
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
02 03 04 05 06 07 08 09 10 11 12 13 14 15


KARACHI STOCK EXCHANGE
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35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
90 92 94 96 98 00 02 04 06 08 10 12 14

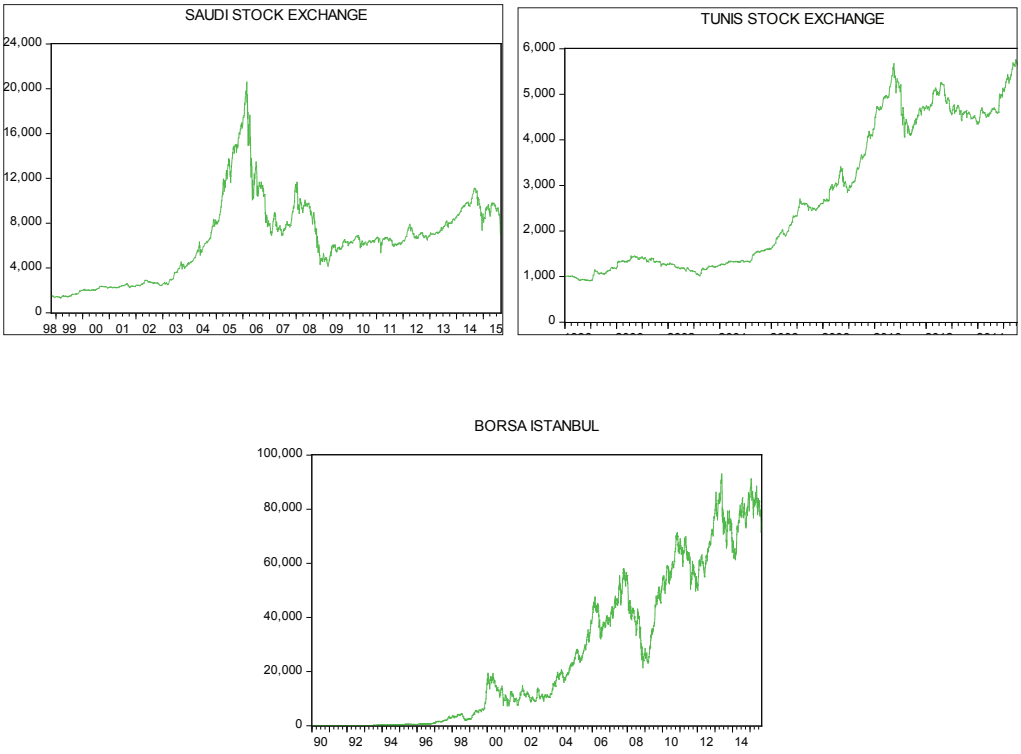
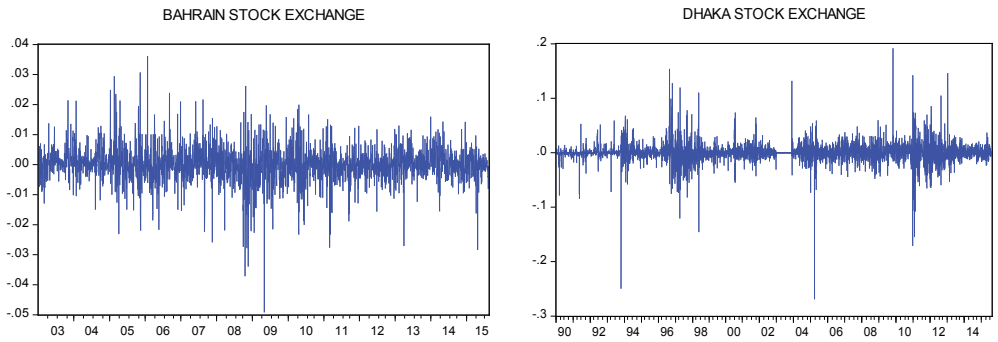
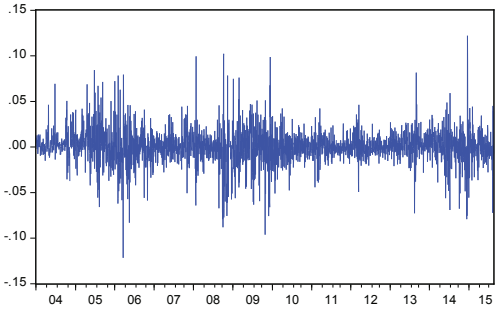


Figure 2: Daily Stock Returns (Excluding Ramadan Days)



DUBAI FINANCIAL MARKET



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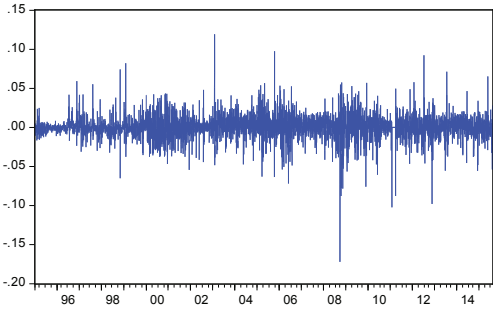
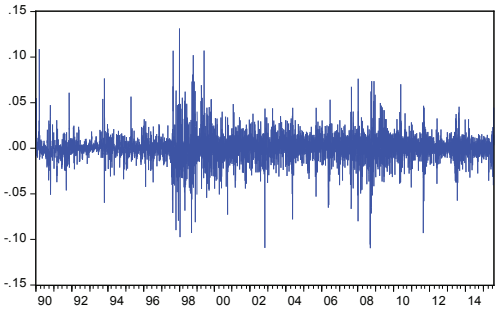
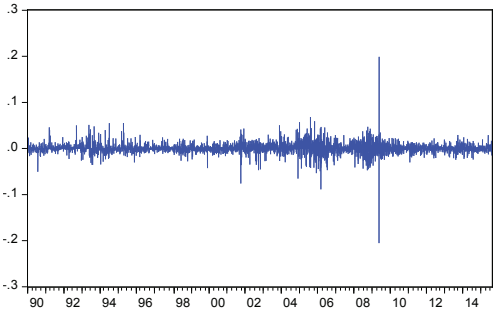


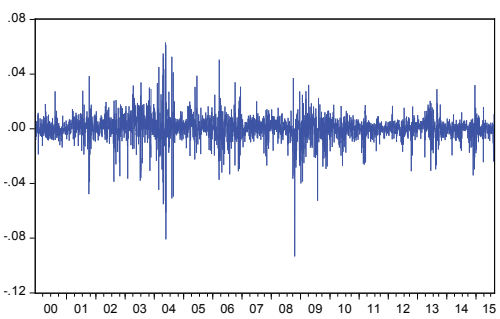
INDONESIA STOCK EXCHANGE



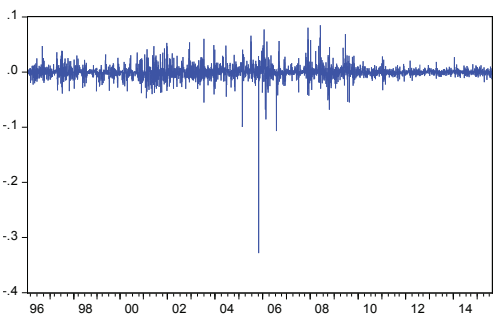
AMMAN STOCK EXCHANGE



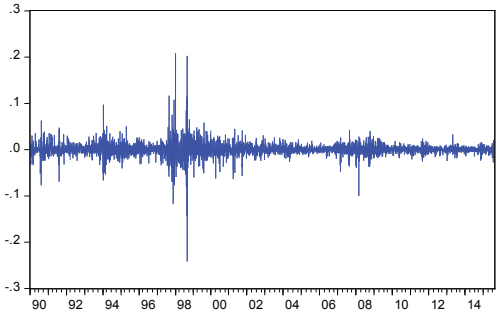
KUWAIT STOCK EXCHANGE



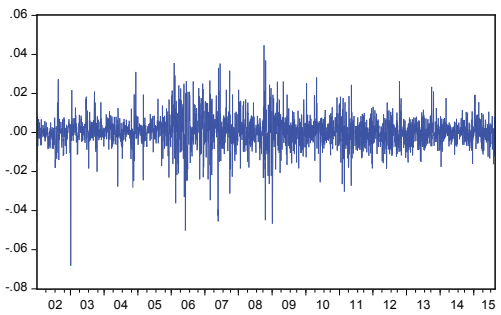
BEIRUT STOCK EXCHANGE



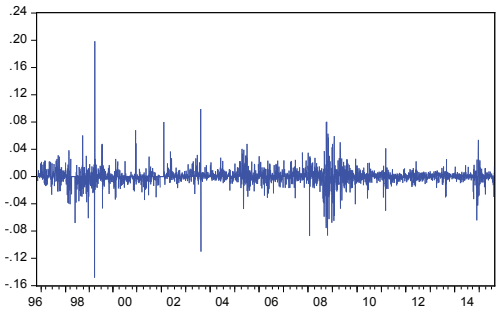
BURSA MALAYSIA



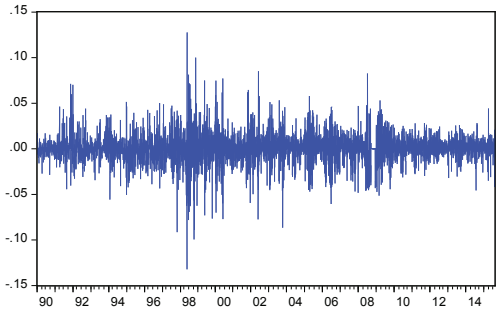
CASABLANCA STOCK EXCHANGE



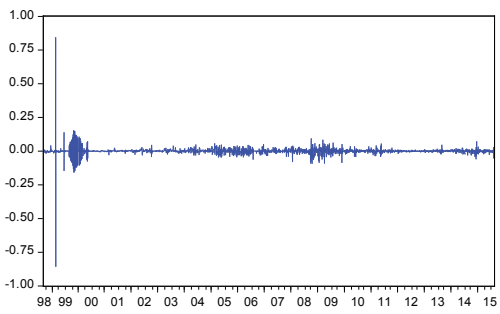
MUSCAT SECURITIES MARKET



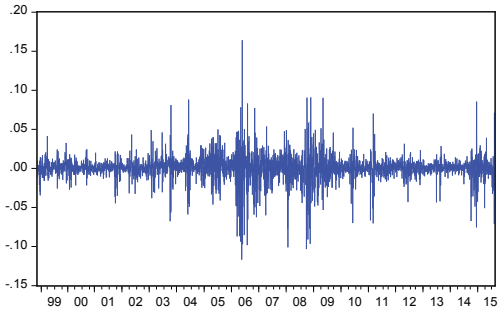
KARACHI STOCK EXCHANGE



QATAR STOCK EXCHANGE



SAUDI STOCK EXCHANGE



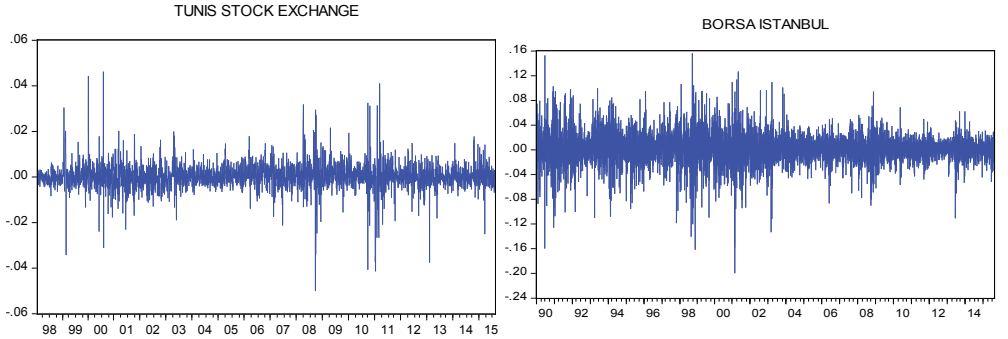
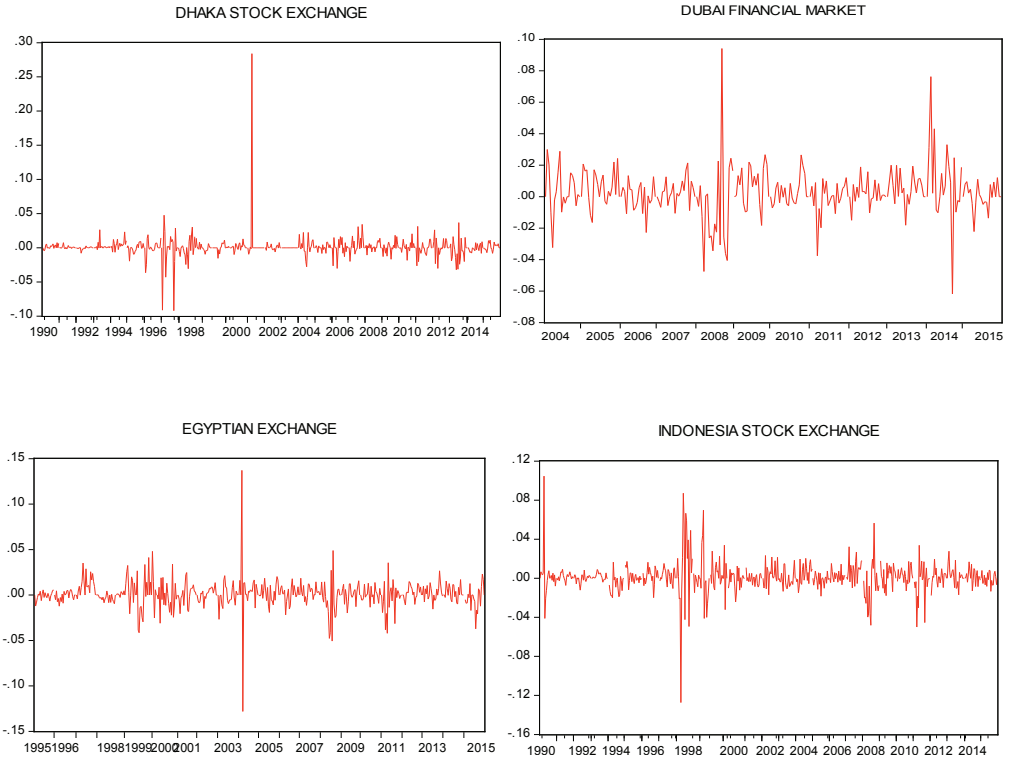
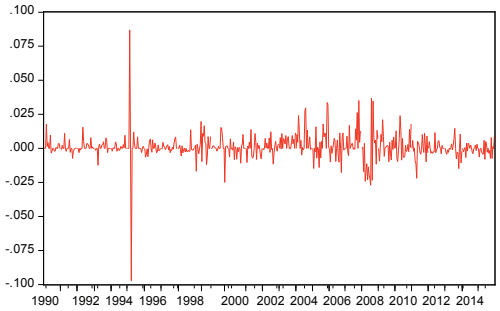


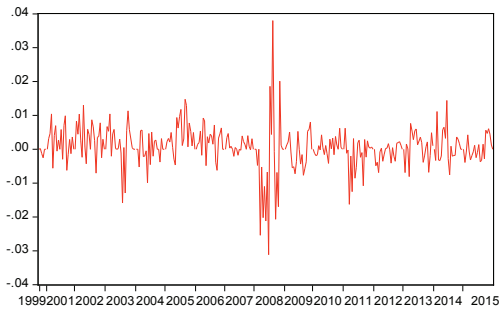
Figure 3: Stock Returns (only Ramadan Days)



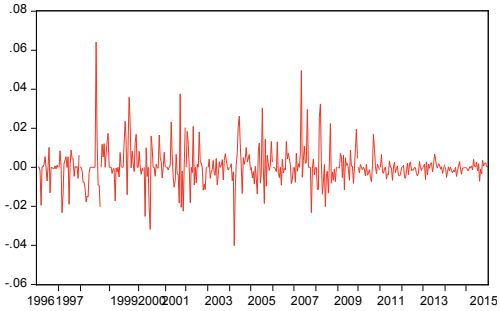
AMMAN STOCK EXCHANGE



KUWAIT STOCK EXCHANGE

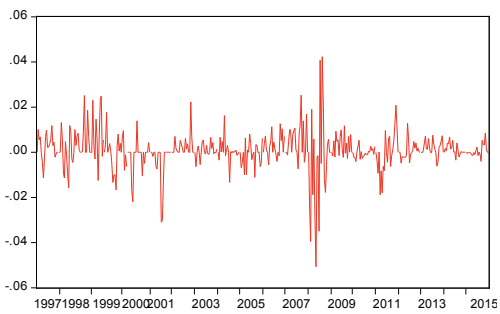


BEIRUT STOCK EXCHANGE



CASABLANCA STOCK EXCHANGE

MUSCAT SECURITIES MARKET



KARACHI STOCK EXCHANGE