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ISLAMIC CALENDAR EFFECT ON THE SAUDI STOCK MARKET (TASI)

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Abstract

Despite the significant impact of Ramadan, Hajj and Ashoura in Islamic countries; however, the extent of its impact in the feelings of investors is different. The research aimed to examine the impact of Ramadan, Hajj, and Ashoura festivals on the Tadawul All-Share Index (TASI) from 1998-2018 on the returns and volatility of financial markets using the GARCH (1, 1) model. Regarding returns, the study found significant changes in returns in the TASI index during the month of Ramadan and Ashoura, and no significant change in returns during the Hajj period. In terms of volume; the study found that there are significant changes in volume during the month of Ramadan compared to other times of the year, and the absence of significant changes in volumes during the Hajj and Ashoura. Regarding the volatility in TASI, the study found no significant fluctuations in the TASI index during the three religious events (Ramadan, Hajj and Ashoura). The researcher recommends conducting further studies in order to reach more facts and try to prove or deny the findings of previous studies.

Keywords: Ramadan, Hajj, Ashoura, the Market Returns, Islamic Countries.

1. Introduction

Each calendar year includes religious and non-religious anomalies. Religious anomalies include the month of Ramadan, the period of Hajj, the Christmas period, Ashoura, etc., and non-religious anomalies include weekends. Al-Kazali el al. (2017) clarified that these anomalies directly affect the performance of the financial market. Religious events, in particular, affect the psychology of investors and are directly reflected on the market situation. Bialkowski et al. (2012) added that these religious events, such as Ramadan, raise the sympathy of investors resulting from this religious event, which lasts for one month a year, increasing their desire for social solidarity and motivate them to perform good deeds and not to default on their financial payments.

On the other hand, despite the significant impact of Ramadan, the period of Hajj and Ashoura in Islamic countries; however, the extent of its impact in the feelings of investors is different. Hajj and Ramadan represent special times for Muslims. These are the appropriate times to atone for sins and to do good deeds (Nofsinger, 2005). As for the Shiites, they represent grief. Therefore, the different way of dealing with these religious events necessarily has a direct impact on the stock market. This is what the current search attempts to explore through focusing on the Saudi's stock market.

Bialkowski et al. (2012) stressed that the psychological state of the investor affects the level of their emotions and therefore affect the decisions they make in the market. This would affect the level of market returns. One of the theories that is concerned with this aspect is the theory of Loewenstein et al. (2001) which called 'risk-as-feeling'. This theory includes that uncertainty and risk affect an individual's decision, and emotions affect one's logic. The theory suggests that if there is a difference between a person's level

of logical assessment and emotional interactions, they necessarily affect the individual's logic when making a decision, and emotional interactions often override the logical assessments. This affects the nature of the decision to be made by the individual. Al-Khazli et al. (2017) also stressed that this theory also assumes that people who have a good mood are more optimistic than other individuals who have a negative mood. Depending on these facts; it can be said that the emotional state of investors affect their attitudes and thus affect the level of their contribution to the proceeds of the financial market.

The evidence confirms that the Islamic religion has influenced and continues to affect the level of economy in Islamic countries. Sonjaya and Wahyudi (2016); Al-Kazali et al. (2017) pointed out that the Islamic religion with its ethics and tolerant principles has affected the level of social relations between individuals and the trends of investors in their investments.

Several past studies aimed to clarify the impact of Ramadan on the economic level of Islamic countries, but the results of the studies were not the same (Weber, 1905). Some studies have shown a positive presence of religious events on the stock market, while other studies have denied the existence of this positive effect and confirmed that it leads to a negative impact (Hilary & Hui, 2009; Bialkowski et al., 2012). Other studies have shown that they have a side effect rather than a fundamental one.

Ramadan represents for Muslims a great importance, where Ramadan includes strengthening the relationship of the Muslim to his Lord through compliance with his orders. This abstention spread from the dawn ears and even to the ears of Morocco (Bialkowski et al., 2012). Thus, Muslims exploit their time in Ramadan by worship, good

deeds and cooperation. In this way, Ramadan enhances the level of social solidarity among Muslims (Beit-Hallahmi and Argyle (1997). The Hajj represents another sacred religious time for Muslims, which every Muslim must perform once in a lifetime. Hajj includes many religious aspects that enhance the patience, endurance and strength of faith among Muslims (Henderson, 2011). Ashoura is the tenth day of the month of Muharram in the Hijri calendar. It is called the day of Ashoura, which is the day on which God saved Moses from Pharaoh. It also coincides with the day on which the grandson of the Prophet Muhammad was killed in the battle of Karbala (Schwartz, 2015).

Some scholars argue that seasons involving religious events can affect the financial market in Islamic countries. Some foreign investors manage certain projects during these periods, thus increasing their level of involvement in the country's economy. Since some investment cases are made by non-Muslims (foreigners), they will work even during times of fasting and holiday, which will have a higher impact on the financial market. Therefor; the study aims to examine Ramadan, Hajj, and Ashoura effects on Saudi's stock market using the GARCH-based model.

1.1 Research importance

Ramadan, Hajj and Ashoura are holy days for Muslims. During this period, investors are influenced by a range of spiritual factors that affect their level of investment and the degree of their desire for risk. The results of the current study can be useful for foreign investors by providing them with important information about the financial

market trends in Saudi Arabia, which will be clarified in the current study. The importance of the study is also represented through relying on the use of GARCH-based model to capture many salient features from data.

The current research represents response for the recommendation of previous studies that discussed the subject of current research. Therefore, the results of the present research will complement the results of the previous studies and prove or negate them. The results of the current study can benefit investors by directing them towards times to maximize their profits and benefit from religious seasons and events.

2. Literature Review

2.1 Anomalies

Anomalies are defined as the deviation of stocks from effective market concepts, resulting in providing investors with additional revenue. Stulz & Williamson (2003) clarified that the anomaly is divided into two; the cases of anomalies associated with religion and non-religious anomalies. Religious-related anomalies include religious events such as Hajj, Ramadan, Ashoura, Easter and others. Non-religious anomalies include weekends and holidays (Sonjaya & Wahyudi, 2016).

Several studies have been conducted to investigate the impact of the Christmas and Good Friday on financial markets. Cadsby and Ratner (1992) concluded that a high level of stock returns before the start of the weekend. Frieder and Subrahmanyam (2004) concluded that stocks rose significantly in the Jewish High Holy days, while

there was a marked decline in Yom Kippur and subsequent days. Aljazira Capital (2014) also noted that the stock indices declined before the start of Ramadan as a result of the departure of a number of investors from Saudi Arabia, and shares remained low during the period of Ramadan, while rising at a constant level after the end of Ramadan.

2.2 Ramadan, Hajj and Ashoura

The beginning of this month's calendar in the Hijri calendar is the ninth, preceded by the month of Sha'baan and followed by the month of Shawwal. This month is the month of fasting for the Muslims. It is one of the five pillars among Muslims and its virtues are abundant (Beit-Hallahmi & Argyle, 1997). The Holy Quran was revealed on the night of al-Qadr. This month represents for Muslims the month of good deeds and the month of giving and charity to the poor and the needy. This month, Muslims are encouraged to pray and read the Qur'aan because the reward is doubled.

Hajj in Islam means heading to Mecca, to perform rituals in the structure of worship to God. Hajj is one of the best worship at the Lord of the Worlds, where Muslim comes back from the Hajj as a new baby, it is an educational journey in which the pilgrim learns the rulings of religion, and following the example of the Prophet Muhammad (peace and blessings of Allaah be upon him) (Al-Islam.org, 2018). The Hajj consists of four pillars, including Ihram, the day of Arafah, the Tawaf Al-Ophaadah, and the quest between Safa and Marwa. Al-Ahram is the first pillar of Hajj, which is the intention to enter into the Hajj. Day of Arafah is the cornerstone of Hajj that is distinguished from 'Umrah, and it is missed to stand in' Arafah. The stand

in 'Arafah day is from noon on the ninth of Dhu al-Hijjah until the dawn of the tenth day. Tawaaf al-Ifta is the second pillar of the Hajj, and it is obligatory so that Hajj is not valid without this pillar. The journey between Safa and Marwah is one of the obligatory pillars of Hajj, and it is stipulated after the tawaaf, where the pilgrim performs seven full runs, the pilgrim may sit a little to rest, but he should not prolong his sitting (Al-Islam.org, 2018).

Regarding the day of Arafah, Schwartz (2015) clarified that Ashoura is the tenth day of the month of Muharram in the Hijri calendar, and on this day God saved his prophet Moses and peace be upon him from Pharaoh. On this day, the Shiites perform many rituals, especially in Karbala, such as visiting the shrine of Al-Hussein, lighting candles, reading the story of Imam Hussein and crying when they hear and slap to express their grief over the incident. As for the Sunnah, the day of Ashoura represents a desirable fast day.

2.3 Investments in Islam

Principles in the Islamic religion serve as guidelines through which individuals can be guided to how to invest (Mitchell et al., 2014). Islamic religion is based on many principles, which are the principles by which individuals are protected and their exploitation protected. Islamic religion is based on the principle that money cannot be used to create more money through what is known as usury (El Gamal, 2000). Consequently, investors cannot maximize their profits through interest and do not have to ask borrowers to pay extra interest when they ask for money. In other respects, traditional finance is a pattern of risk patterns, in which any form of speculation, such as futures, guarantees, etc. is not used (Mitchell et al., 2014). Thus, investors do not

find what attracts them to invest their shares during the month of Ramadan.

On the other hand, financing in Islamic religion does not allow individuals to invest their money in illicit products, such as promotion of spirits, drugs, and others (Mitchell et al., 2014). Since such acts are necessarily linked to acts that violate morality and commit evil.

The principle of financing in Islam is based on the fact that the nature of work between investors and debtors is based on the principle of sharing risks and profits. But at the moment business is not done on this basis, and investors do not share the risk of working with debtors (El Gamal, 2000, Cavanaugh et al., 2008).

Al-Ississ (2000) stressed that the place where people live and practice their lives necessarily affects their religious beliefs, and the holidays also affect many aspects, including the economic aspect. Al-Ississ (2010) pointed out that the level of commitment of individuals to the Islamic religion affects their behavior and habits, and thus affects the level of the economy in the country.

Moreover, the economic situation in the country necessarily influenced by the nature of religious events, Ramadan, Hajj and Ashoura are one of these religious occasions (Bley and Saad, 2010). Ramadan in particular witnessed a decline in the level of activity of individuals, which affects the level of economic activity in the country. At the end of this month, which is preparing to receive the Eid al-Fitr, people buy new clothes and prepare for Eid al-Fitr (Abbes & Abdelhédi 2015). In return, traders raise their prices, and this affects the general economic level in countries (Wasiuzzaman & Al-Musehel 2017).

2.4 The influence of Ramadan, Hajj and Ashoura on stock markets in Islamic countries

A number of studies have been conducted to investigate the impact of Islamic calendar on the financial market in Islamic countries. Some studies have shown that religious events like Ramadan contribute to raising stock returns in the financial market, while other researchers have found no correlation between stock returns and these events (Seyyed et al., 2015; Al-Ississ, 2010; Bialkowski et al., 2012, Aljazira Capital, 2014).

The studies conducted on the impact of Ramadan on the revenues of the financial market in Islamic countries showed differences in the results. Bialkwoski et al. (2012) and Al-Khazali (2014) concluded in his study that the returns of shares rise significantly in the month of Ramadan compared to other months. This is necessarily due to investor optimism and psychological and emotional improvement. Seyyed et al. (2005) noted a decline in the level of profits and returns during the month of Ramadan. Sonjaya and Wahyudi (2016) in their study found that there is no rise in the stock market in Islamic countries, such as Bahrain and Saudi Arabia during Ramadan. A study found a decline in the level of financial stocks during the period of Ramadan in Saudi Arabia (Aljazira Capital, 2014). Ariss (2001) concluded that financial stocks witnessed a significant increase on the last day of Ramadan.

Husain (1998) conducted a study on the Pakistani stock market; found that the volatility of equities in Ramadan is not significantly different from the rest of the year.

Seyyed et al. (2005) conducted a study to analyze the situation of the Saudi stock market during the period from 1998 to 2000, and concluded that the level of stock change has not changed much.

From another hand, Al-Hajieh et al. (2011) in their eight-country study in the Middle East during the period 1992 to 2007 found that six of the eight countries had witnessed a marked increase in financial returns. Carl and Azzzudin (2010) reaches similar results, where they found that the period from 2000 to 2003 witnessed a marked increase in the Malaysian stock market during Ramadan. Bialkoswki et al. (2012) confirmed this result when he conducted their study in 14 Muslim countries during the period 1989 to 2007, and they pointed out the rise in stock returns during the month of Ramadan.

Concerning the impact of Hajj on the stock market, most of the studies conducted in this regard have concluded that the Hajj period witnessed fluctuations in share prices. Wassiuzzaman (2017) conducted a study to study the impact of Hajj on the Saudi stock market, and the results reached the absence of significant fluctuations in prices of importance during the Hajj.

Halari et al. (2015) in his study reached to a similar result, and stressed that the pilgrimage does not cause a rise in financial stocks, but increases the volume of volatility in the money market. Halari et al. (2015) explained this result due to that the Hajj is obligatory for every Muslim who performs it once in his life. It requires that the Muslim be fully devoted to its performance. Thus, the economic activity of the pilgrims in Saudi Arabia will be reduced. This necessarily affects the stock market indices.

Agarwal (2015) concluded that the volume of shares traded in the TASI index is significantly lower in the month before Ramadan, where sales volume is at its lowest level. In the third week of Ramadan, shares start to rise gradually due to increased demand for commercial activities. Al-Ississ (2010) also found similar results to Agarwal (2015). In the two weeks preceding Ramadan, the TASI index is clearly declining and is starting to rise significantly in the fourth week. Al-Ississ (2010) concluded that the effect of Hajj and Ashura on Saudi stocks is negative, as the volume of revenues is low because individuals devote their time to worship mainly.

3. Data and methodology

The researcher relied on the daily data of the Tadawul All-Share Index (TASI) from Saudi Arabia to establish whether Ramadhan, Hajj, and Ashoura festivals cause volatility, affects returns, and lead to changes in volumes traded in the country's financial market. The researcher used the data used from January 1998 to December 2017. The research applied the GARCH-based specification, which is essential when there is a variation in the conditional mean and variance.

The effects of Ramadan, Ashoura, and Hajj on daily returns, volatility, and volume for the TASI is done using a GARCH model. Eq. (1) estimates the Ramadan, Ashoura, and Hajj effects which are modelled as dummy variables, Ramadan dummy ($D_{Ramadan}$), Ashoura dummy ($D_{Ashoura}$), Hajj dummy (D_{Hajj}). The auto regressive (AR) and the moving average (MA) effects are captured by the lagged values of the return variable and the lagged error values respectively. To reduce the auto correlated residuals, the

AR and MA terms of order k and included in the equation (Seyyed et al., 2015).

$$r_t = \mu_0 + \alpha_t D_{\text{Ramadan}} + \sum_{i=1}^{k} \phi_i r_{t-i} + \sum_{j=1}^{k} \theta_j \varepsilon_{t-j} + \varepsilon_t$$

Where (D_{Ramadan}) = 1 for days in the year when there is Ramadan holiday, and 0 for other periods

To estimate the variance equation (shown in equation 2) the time-varying volatility is modeled as a GARCH (p, q). In the conditional variance, the orders p and q are linear functions of past squared error and lagged variance. The Full Information Maximum Likelihood procedure is used to estimate equation 1 and 2 jointly and establish the effects of Ramada on return and volatility (Seyyed et al., 2015).

$$h_t = v_0 + \beta_t D_{\text{Ramadan}} + \sum_{i=1}^{p} \gamma_i \varepsilon_{t-i}^2 + \sum_{j=1}^{q} \delta_j h_{t-j}$$

Where,

V_0, $_{\gamma i}$, $^{\delta}_j$ is a non-negative parameter to be estimated,

$p > 0$, and $q >= 0$ define the order of the process

β_t captures the Ramadan effect on returns volatility.

The estimated parameters should also be non-negative for them to have positive

conditional variances. To ensure that the conditional variance is non-explosive and stationary, the restriction $\sum \gamma_i + \sum \delta_j < 1$ must be satisfied (Seyyed et al., 2005, p. 279)

4. Findings

4.1 Analysis without Controlling for Each Event Separately (Ramadan, Ashoura, Hajj)

The researcher used the command function in EViews to estimate the Ramadan, Hajj, and Ashoura effects on the returns in the TASI. The dummy value for when there was not Ramadan, Hajj, or Ashoura was 0, whereas it was 1 for the days when there was each holiday. To test whether Ramadan, Ashoura, or Hajj effects have any impact on the rate of return for the TASI, I first used the command function in EViews. In the model, the rate of return was the dependent variable, and dummy for Ashoura, Dummy for Hajj, and Dummy for Ramadan were the independent variables. The level of significance for Ashoura, Hajj, and Ramadan were calculated automatically using EViews; therefore, the model simultaneously explained whether there was a Ramadan, Ashoura, or Hajj effects on returns. Although I wanted to estimate the model from January 1998, I only used data from December 2011 since it was the only continuous data for volume.

4.1.1 Returns of the TASI during Ramadan, Hajj, and Ashoura

Table 1 shows the solution of GARCH model (1, 1) for control of Ramadan, Ashoura, and Hajj for returns. The results show that the coefficient of return for Ramadan is significant. In this regard, I concluded that there is a significant change in returns in TASI during Ramadan when compared to other periods of the year. During Ramadan, the TASI increased by 0.001768 holding other factors constant, which is shown by the Ramadan co-efficient.

The results also show that the coefficient of return for Ashoura is significant. In this regard, I concluded that there is a significant change in returns in TASI during Ashoura when compared to other periods of the year. During Ashoura, the TASI decreases by 0.007116 holding other factors constant, this is shown by the Ashoura coefficient.

The results show that the coefficient of return for Hajj is not significant. Accordingly, I concluded that there is no significant change in returns in TASI during Hajj when compared to other periods of the year. During Hajj, the TASI decreases by 0.00738 holding other factors constant, this is shown through the Hajj coefficient.

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Table 1: Solution for the Estimate Equation of Ramadan, Ashoura, Hajj Returns

Dependent Variable: RETURN_IN__
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)
Date: 04/26/18   Time: 05:28
Sample: 12/24/2011 1/31/2018
Included observations: 1528
Convergence achieved after 24 iterations
Coefficient covariance computed using outer product of gradients
Presample variance: backcast (parameter = 0.7)
$GARCH = C(5) + C(6)*RESID(-1)^2 + C(7)*GARCH(-1)$

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.000716	0.000210	3.400431	0.0007
DUMMY__ASHOURA_HOLIDAY_	-0.007116	0.003279	-2.169882	0.0300
DUMMY__HAJJ_HOLIDAY_	-0.007657	0.005236	-1.462354	0.1436
DUMMY__RAMADAN_HOLIDAY_	0.001768	0.000438	4.036333	0.0001
Variance Equation				
C	3.31E-06	4.60E-07	7.198505	0.0000
RESID(-1)^2	0.205961	0.017126	12.02624	0.0000
GARCH(-1)	0.791722	0.013688	57.83972	0.0000

R-squared	0.002286	Mean dependent var	0.000124
Adjusted R-squared	0.000322	S.D. dependent var	0.010894
S.E. of regression	0.010892	Akaike info criterion	-6.600929
Sum squared resid	0.180793	Schwarz criterion	-6.576504
Log likelihood	5050.110	Hannan-Quinn criter.	-6.591838
Durbin-Watson stat	1.724911		

The results of the current study were similar to Seyyed et al. (2005), which found that there was no significant difference in returns during the month of Ramadan. It is similar

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to the results of Ashraf (2017) that concluded that Ashoura did not significantly affect annual stock returns.

4.1.2 Volume of the TASI during Hajj, Ashoura, and Ramadan

Table 2 shows the solution of GARCH model (1, 1) for control of Ramadan, Ashoura, and Hajj for volumes. The results show that the coefficient of volume for Ramadan is significant. In this regard, I concluded that there is a significant change in volumes in TASI during Ramadan when compared to other periods of the year. Regarding Ashoura, the results show that the coefficient of return for Ashoura is not significant. Regarding Hajj, the results show that the coefficient of return for Hajj is not significant.

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Table 2: Solution for Estimate Equation for Ramadan, Ashoura, Hajj (Volume)

| View | Proc | Object | | Print | Name | Freeze | | Estimate | Forecast | Stats | Resids |

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Dependent Variable: CHANGE_IN_VOLUME
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)
Date: 04/26/18   Time: 05:26
Sample: 12/24/2011 1/31/2018
Included observations: 1528
Convergence achieved after 26 iterations
Coefficient covariance computed using outer product of gradients
Presample variance: backcast (parameter = 0.7)
GARCH = C(5) + C(6)*RESID(-1)^2 + C(7)*GARCH(-1)
```

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.006373	0.004694	-1.357732	0.1745
DUMMY__ASHOURA_HOLIDAY_	0.165918	0.109113	1.520598	0.1284
DUMMY__HAJJ_HOLIDAY_	0.117604	0.340659	0.345226	0.7299
DUMMY__RAMADAN_HOLIDAY_	0.047824	0.011542	4.143439	0.0000
Variance Equation				
C	0.036662	0.002146	17.08416	0.0000
RESID(-1)^2	0.394916	0.029816	13.24510	0.0000
GARCH(-1)	-0.007539	0.035203	-0.214166	0.8304
R-squared	0.000121	Mean dependent var		0.000111
Adjusted R-squared	-0.001847	S.D. dependent var		0.237936
S.E. of regression	0.238156	Akaike info criterion		-0.154080
Sum squared resid	86.43843	Schwarz criterion		-0.129654
Log likelihood	124.7170	Hannan-Quinn criter.		-0.144989
Durbin-Watson stat	2.664175			

These results are similar to the results of previous studies which revealed a significant change in volumes during the month of Ramadan, with no similar effect to Ashura (Abadir and Spierdijik, 2005). The level of impact of volumes for Hajj is not the same in Ramadan.

4.1.3 Volatility of TASI During Ramadan, Hajj, and Ashoura

The establishment of whether the market is volatile is done through the tests of stationarity in the model. There is no significant difference in volatility in the TASI index during Ramadan, Ashoura, and Hajj festivals when compared to other periods of the year.

Table 3 and 4 show that there is ARCH effect in the model, the autocorrelation function (ACF) and partial autocorrelation function (PACF) confirm that the data is stationary. Note that the p-values in Table 3 and 4, the correlograms of volume and return are zero, which show that they are not of heteroscedastic. Therefore, the data is stationary. The Durbin-Watson statistic of returns is 1.724911 (Figure 4.1-2), and the Durbin-Watson statistic for volumes is 2.664 (Figure 4.1-4). These statistics further support that there is no autocorrelation in the model. Since the volatility process is non stationary, it therefore means that there is no volatility in the TASI index during Ramadan, Ashoura and Hajj festival periods compared to other periods of the year.

The study found that there is no significant change in the fluctuations during the month of Ramadan, Hajj and Ashura, and this result is consistent with the study of Seyyed (2005), which concluded that Saudi Arabia is experiencing low fluctuations during the month of Ramadan. This result is also consistent with a study conducted on a group of Muslim countries, including Saudi Arabia, where the study found no significant differences in volatility during the Hajj, Ramadan and Ashura.

Table 3: Correlogram of Returns

EViews - [Series: RETURN_IN__   Workfile: TASI DAILY DATA::Untitled\]

File   Edit   Object   View   Proc   Quick   Options   Window   Help

View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats | Ident
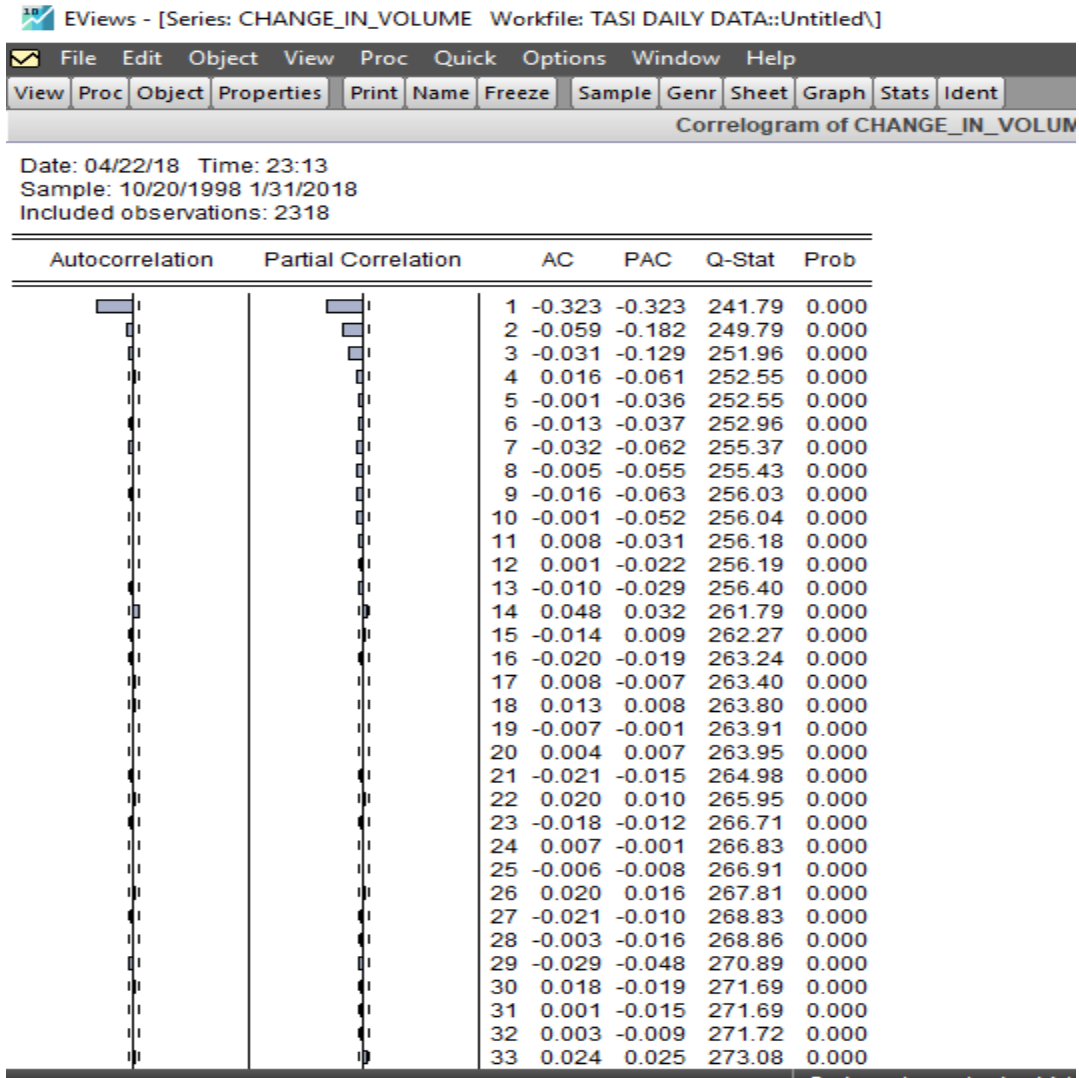
Correlogram of RETURN_IN__

Date: 04/22/18   Time: 23:11
Sample: 10/20/1998 1/31/2018
Included observations: 5168

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.076	0.076	29.709	0.000
		2	-0.027	-0.033	33.462	0.000
		3	0.044	0.049	43.423	0.000
		4	0.027	0.019	47.141	0.000
		5	0.050	0.049	59.829	0.000
		6	-0.027	-0.036	63.670	0.000
		7	-0.045	-0.039	74.044	0.000
		8	0.016	0.015	75.304	0.000
		9	0.019	0.015	77.229	0.000
		10	-0.029	-0.028	81.609	0.000
		11	0.044	0.054	91.837	0.000
		12	0.011	0.002	92.445	0.000
		13	0.023	0.023	95.104	0.000
		14	0.048	0.039	106.99	0.000
		15	0.013	0.011	107.90	0.000
		16	0.022	0.015	110.36	0.000
		17	-0.004	-0.012	110.46	0.000
		18	-0.021	-0.019	112.76	0.000
		19	0.035	0.033	118.99	0.000
		20	0.045	0.039	129.31	0.000
		21	-0.016	-0.014	130.65	0.000
		22	-0.032	-0.031	136.03	0.000
		23	-0.005	-0.005	136.17	0.000
		24	0.036	0.030	142.86	0.000
		25	-0.003	-0.013	142.90	0.000
		26	-0.037	-0.027	150.20	0.000
		27	-0.030	-0.028	154.82	0.000
		28	0.014	0.008	155.79	0.000
		29	-0.004	-0.009	155.88	0.000
		30	0.023	0.031	158.60	0.000
		31	0.010	0.008	159.08	0.000
		32	-0.026	-0.028	162.64	0.000
		33	0.001	-0.004	162.65	0.000

Table 4: Correlogram of Change in Volume

EViews - [Series: CHANGE_IN_VOLUME   Workfile: TASI DAILY DATA::Untitled\]

File   Edit   Object   View   Proc   Quick   Options   Window   Help

View | Proc | Object | Properties | Print | Name | Freeze | Sample | Genr | Sheet | Graph | Stats | Ident

Correlogram of CHANGE_IN_VOLUM

Date: 04/22/18   Time: 23:13
Sample: 10/20/1998 1/31/2018
Included observations: 2318

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.323	-0.323	241.79	0.000
		2	-0.059	-0.182	249.79	0.000
		3	-0.031	-0.129	251.96	0.000
		4	0.016	-0.061	252.55	0.000
		5	-0.001	-0.036	252.55	0.000
		6	-0.013	-0.037	252.96	0.000
		7	-0.032	-0.062	255.37	0.000
		8	-0.005	-0.055	255.43	0.000
		9	-0.016	-0.063	256.03	0.000
		10	-0.001	-0.052	256.04	0.000
		11	0.008	-0.031	256.18	0.000
		12	0.001	-0.022	256.19	0.000
		13	-0.010	-0.029	256.40	0.000
		14	0.048	0.032	261.79	0.000
		15	-0.014	0.009	262.27	0.000
		16	-0.020	-0.019	263.24	0.000
		17	0.008	-0.007	263.40	0.000
		18	0.013	0.008	263.80	0.000
		19	-0.007	-0.001	263.91	0.000
		20	0.004	0.007	263.95	0.000
		21	-0.021	-0.015	264.98	0.000
		22	0.020	0.010	265.95	0.000
		23	-0.018	-0.012	266.71	0.000
		24	0.007	-0.001	266.83	0.000
		25	-0.006	-0.008	266.91	0.000
		26	0.020	0.016	267.81	0.000
		27	-0.021	-0.010	268.83	0.000
		28	-0.003	-0.016	268.86	0.000
		29	-0.029	-0.048	270.89	0.000
		30	0.018	-0.019	271.69	0.000
		31	0.001	-0.015	271.69	0.000
		32	0.003	-0.009	271.72	0.000
		33	0.024	0.025	273.08	0.000

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5. Results and conclusion

The study aimed to examine the impact of Ramadan, Hajj, and Ashoura festivals on the Tadawul All-Share Index (TASI) from 1998-2018 using the GARCH (1, 1) model. It is widely accepted that seasonal effects, such as those caused by major religious ceremonies have a significant impact on the returns and volatility of financial markets. A GARCH analysis was conducted using EViews SV (student version).

Ramadan represents for Muslims a great importance, where Ramadan includes strengthening the relationship of the Muslim to his Lord through compliance with his orders. The Hajj represents another sacred religious time for Muslims, which every Muslim must perform once in a lifetime. The study found that psychological state of the investor affects the level of their emotions and therefore affect the decisions they make in the market. This would affect the level of market returns.

Regarding the impact of Ramadan on the Tadawul All-Share Index (TASI), the research found that there is significant change in returns of the TASI during Ramadan when compared to other periods of the year, there is no significant difference in volatility in the TASI during Ramadan when compared to other periods of the year and there is significant change in volumes of the TASI during Ramadan when compared to other periods of the year.

Regarding the impact of Ashoura on the Tadawul All-Share Index (TASI), the research found that there is significant change in returns of the TASI during Ashoura when compared to other months, there is no significant difference in volatility in the TASI

during Ashoura when compared to other periods of the year and there is no significant change in volumes of the TASI during Ashoura when compared to other periods of the year.

Regarding the impact of Hajj on the Tadawul All-Share Index (TASI), the research found that there is no significant change in returns of the TASI during Hajj when compared to other periods of the year. Holding other factors constant, there is no significant difference in volatility in the TASI index during Hajj when compared to other periods of the year and there is no significant change in volumes of the TASI during Hajj when compared to other periods of the year. Holding other factors constant. The researcher recommends conducting further studies in order to reach more facts and try to prove or deny the findings of previous studies.

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