The effect of Islamic sacred months on stock prices in Iran and Iraq Stock Exchanges

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Abstract

Purpose – The present study aims to examine the effects of the Islamic sacred months, namely, Muḥarram, Rajab, Dhu al-Qaʿdah and Dhu al-Ḥijjah, on stock prices on the Iran and Iraq Stock Exchanges.

Design/methodology/approach – Using the infrastructure models of the capital market, the daily stock prices were calculated for the sacred and non-sacred months. As the data of this study are non-stationary, the AMIRA time-series model was used for better understanding of the model or future projections. The dependent variables of this study are the daily stock indexes for Iranian and Iraqi Stock Exchanges, and independent ones are the sacred and non-sacred months of a lunar year. Data were gathered daily from the financial statements of Iranian and Iraqi Stock Exchanges websites. To test the hypotheses under study, a five-year period from 2012 to 2016 was considered for both Iraqi and Iranian Stock Exchanges, which corresponds with the lunar calendar from 1433-1437AH.

Findings – The obtained results indicated that there is no significant difference in stock prices between the sacred months of Muḥarram, Rajab, Dhu al-Qaʿdah and Dhu al-Ḥijjah and other non-sacred months. However, the stock price in the Iranian Stock Exchange has a significant difference in Rajab and Dhu al-Qaʿdah with other non-sacred months.

Originality/value – The results of this study will reveal more than ever the role of Islamic sacred months for society and users of financial statements to make better financial decisions especially in Islamic emerging markets.

Keywords Stock price, Calendar anomalies, Non-calendar anomalies, Sacred months

Paper type Research paper

Introduction

An efficient capital market is one in which the stock price reflects all available information and where investors logically respond to new information (Hashemi *et al.*, 2014). However, many scholars believe that information which reaches the market gradually or with delay would affect the stock price (Foroghi and Dastjouri, 2015). As soon as the market becomes detached from its efficient status, the process of revision and adjustment in the stock price goes through a time lag and the market responds slowly to new information (Fadaei Nejad and Kamelnia, 2013). Two types of calendars are used in many Islamic countries. The

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Gregorian calendar is often used in business activities, whereas the lunar calendar, which is based on the Islamic months and is also called the Hijri calendar, defines the holidays and religious ceremonies during the year. The financial markets of the Islamic countries work according to the Gregorian months, whereas Iranians use the Hijri calendar. The lunar days and months are respected among Muslims (Aflatooni and Sohrabi, 2015).

The aim of the present study is to discover the relationship between the sacred months of a year and stock indexes in the Iranian and Iraqi Stock Exchanges. These months are noteworthy for Muslims from the perspective of the Noble Qur'ān. This study will discuss theoretical principles and the literature. In buying and selling decisions, all related information will be considered in the stock price, so it is an appropriate index for defining the value of the investment. Next, the paper puts forward the methodology and findings. Finally, a summary is provided of the results along with concluding remarks.

Theoretical principles and literature review

Within the past three decades, the market hypothesis has been the main subject of financial studies. According to Fama (1970), the capital market is informationally efficient when the price of securities reflects all available information in the market. According to different kinds of information, Fama (1965) classified market efficiency into three levels: weak, semi-strong and strong. In case the stock price is merely reflective of historical information, efficiency would be weak; if the stock price, in addition to the historical information, is reflective of the current information, efficiency would be semi-strong; and if the stock price is reflective of all available information (including historical, current and confidential), the market would be classified as strongly efficient. However, scholars believe that markets are rarely strong and efficient. They claim that the efficiency of markets is conventionally at the semi-strong or weak level.

Since the development of the efficient market hypothesis by Fama and Blume (1966), numerous studies were carried out on this topic and most of them were either in line or in contrast with the hypothesis. Calendar anomaly is one of the cases that violates the efficient market hypothesis and affects the capital market. In the financial literature, calendar anomaly refers to the effect of special days and months of a year on different aspects of the Stock Exchange market.

For example, Bahloul *et al.* (2017) studied the calendar effects during 2011-2015 in the Indian stock market. Using the monthly and daily stock return of the National Stock Exchange Index, they evaluated GARCH standard, GARCH-in-Mean, GARCH represents and ARCH Threshold models to test calendar anomalies. The obtained results showed that "the December effect"– i.e. the effect caused by the end of the fiscal year – is high in the Indian stock market, even after considering the temporal fluctuation variable. Another finding of the study is that, as was shown in the results of EGARCH and TARCH models, there is no information asymmetry in the Indian stock market.

Such complications are called calendar (seasonal) anomalies (Fama, 1965). These include the effect of the first day of the week (Monday effect), as well as the effect of the first month of the Gregorian calendar (January effect). According to the Monday effect, the stock price on this day is significantly higher than other days of the week. For example, Rogalski (1984) studied the first and last prices for the Dow Jones Index during 1974-1984 and for the S&P500 during 1979-1984. He noticed that prices increased on Monday. Hence, negative returns were made between the end of transactions on Friday and their beginnings on Monday. Thus, the Monday effect turned into the weekend effect. Rogalski also noted that weekends in January are different from weekends in other months. During January, the

return of Mondays and weekends is positive. He used a virtual variable-based regression model in this study.

In addition, Alexakis and Xanthakis (1995) evaluated the effect of days of the week on the stock market of Greece during 1985-1994 and the two sub-periods of 1985-1987 and 1988-1994. As variance is time-dependent, they used the GARCH-M regression model in this study. The average return was higher on Fridays than other days of the week, though the issue was more obvious in the first period. It is noteworthy that the average return on Monday, especially in the first sub-period, was not negative, while it was negative on Tuesday. However, in the second sub-period, the negative return of Tuesday loosened gradually, while the negative return of Monday was developing.

Iqbal and Roy (2015) also evaluated the effect of days of the week on the stock market and attempted to identify the important and effective days of the stock market in developing countries like Bangladesh. The findings illustrated that the lowest and highest returns are on Thursdays and Mondays, respectively, and the minimum and maximum fluctuations are on Mondays and Wednesdays, respectively. Khediri and Daadaa (2011) studied the effect of days of the week on the Tunisian stock market and compared that with the pattern of international markets. Remarkable differences are observable in the effects of all days of the week or month on international markets. The results of the sample of this study, which comprised 24 listed stocks in the Tunisian stock market, showed similar effects to those of developed countries. Monday has an abnormally low return, while Friday has a high return, the highest of any day of the week. The loss increases from Monday throughout the rest of the days of the week.

Coutts and Sheikh (2002) examined the effect of days of the week, months, and weekends on three main indexes of Athens' stock industry and showed the effect of January on these indexes. They also observed a considerable anomaly on weekends and positive return on Fridays. Bazazan *et al.* (2014) studied the return in the Iranian market on different days of the week and found that the total return of Saturday is positive and significant.

By studying the effect of Ramadan on the securities of Muslim countries, Al-Hajieh *et al.* (2011) perceived that the stock return on the first and last days of that month are significantly increased. In this regard, Bialkowski *et al.* (2012b) found that the stock return during Ramadan is increased considerably and its fluctuations decreased. They attributed such findings to the spirits of investors and believed that Ramadan could sharpen the sense of solidarity and social responsibility among Muslims and motivate optimistic beliefs among investors.

By contrast, there are some studies with results in the opposite direction. For instance, Al-Atiyat (2014) studied for the first time the effect of Ramadan on the United Arab Emirates' stock market and found that during 2008-2013 the average return for banks in Ramadan was less than usual. They also discovered that the economy declined slightly in Ramadan by 0.98 per cent.

Shahverdiani *et al.* (2013) considered the effects of the Hijri calendar on stock performance in the Iranian market as well as the number of transactions on the Tehran stock market of during the years 1383-1390 AH. The research concluded that the Hijri months, namely, Ramadan and Muḥarram, do have an effect on the Tehran Stock Exchange. However, no significant difference was noticed because of the transaction volume during the mentioned months. Moreover, Sinaei and Mohammadi (2012) studied the effect of Ramadan on Tehran Stock Exchange and discovered that this month has no negative and significant effect on the average returns of total indices, price and cash return, and primary and secondary markets. However, the effect of this month was both negative and significant on the volatility of the total index efficiency, price, cash return and the secondary market.

They also revealed that Ramadan has no significant effect on the volatility of the primary market and industry indices return.

Research methodology

The required data and information were gathered using the financial statements of companies listed on the Iran and Iraq Stock Exchanges, which are available on the websites from 1433AH until 1437AH (equivalent to Gregorian calendar years 2012-2016). The daily stock prices were calculated for the sacred and non-sacred months for both countries. As the data of this study are non-stationary, the AMIRA time-series model was used for better understanding of the model or future projections.

Research hypotheses, variables and model

Research hypotheses

To test the effect of Islamic sacred months on stock prices in Iran and Iraq Stock Exchanges, four hypotheses have been tested for each country, as follows:

Iraq

H1. The Iraqi stock price in Muḥarram is different from that of the other months.

H2. The Iraqi stock price in Rajab is different from that of the other months.

H3. The Iraqi stock price in Dhu al-Qaʿdah is different from that of the other months.

H4. The Iraqi stock price in Dhu al-Ḥijjah is different from that of the other months.

Iran

H5. The Iranian stock price in Muḥarram is different from that of the other months.

H6. The Iranian stock price in Rajab is different from that of the other months.

H7. The Iranian stock price in Dhu al-Qaʿdah is different from that of the other months.

H8. The Iranian stock price in Dhu al-Ḥijjah is different from that of the other months

Independent variables

The independent variables of the study are the sacred and non-sacred months of the lunar year; 0 is given for the sacred month and 1 for others.

Dependent variables

The dependent variables are the daily stock indexes for Iranian and Iraqi Stock Exchanges. The stock price is the stock market price during a transaction on the stock exchange. In such a market, the price is determined based on the purchase and sale orders (supply and demand) of securities.

Research model

In statistics and econometrics, and especially in time-series analysis 1, an integrated moving average (ARIMA) is an extended model of an intermediate moving average (ARMA). Such models are used in time-series for better understanding the model or for forecasting the future. Such models are applied to non-stationary data. In this state, the integrated non-

stationary data and the possibility to estimate an ARMA in new data will be provided with one-time differentiation.

This model is shown in most of the cases as ARIMA (p, d and q), in which (p, d and q) are three non-negative real numbers which determine the degree of correlation, integration and moving average. ARIMA models are an important part of the Box–Jenkins approach to time-series models. In case one of the components is equal to zero, it would be written as AR or MA, respectively, as follows:

$$Y_t = \sum_{i=1}^{p} \phi_i \; Y_{t-i} + e_t$$

$$Y_t = \alpha_0 + \varepsilon_t + \sum_{i=1}^{q} \phi_q \varepsilon_{t-i}$$

where, Y_t is stock price and ε_t is the white noise (Gaussian Noise). Also, p and q are the order of AR and MA series, respectively.

In this study, we are concerned about the relationship between sacred months of a year and the stock index. The main research model for the hypotheses is presented by the following equation:

$$\nabla_{yt}^{d} = \alpha_0 + \sum_{i=1}^{p} \phi \, Y_{t-1} + \sum_{i=1}^{q} \phi_j \varepsilon_{t-j} \; + \alpha_1 X_{it} \; + \; \varepsilon_{\mathrm{it}}$$

where:

$\nabla_{Y_t}^{d}$ = differential variable of d order;

Y_{it} = dependent variable: (price/index) stock in the Iraqi or Iranian Stock Exchange; and

ϕ = a parameter related to ARIMA.

The second part of this equation includes: $\alpha_0 + \alpha_1 X_{\mathrm{it}} + \varepsilon_{\mathrm{it}}$

where:

X_t = Independent variable: the effect of a sacred month.

It is 1 if we are in a sacred month and 0 for other months. In case such a variable is significant, we say that the sacred month has a more significant effect on the dependent variable than other months. Moreover, the α_1 parameter is related to the regression coefficient of the independent variable and ε_i is the model error.

Results of the study

First, the descriptive statistics will be presented of the variables under study, as in Table I.

Based on the table, it is observed that there is no significant difference in Rajab in both countries, compared with Muḥarram. However, descriptive analysis is not enough to support such conclusion.

As the obtained p-value in Table II is more than 0.05 level of error, *H1*, *H2*, *H3*, *H4*, *H7* and *H8* are not accepted; however, there is sufficient and reliable evidence to prove the *H5* and *H6* of this research. To put it another way, as the obtained p-value of *H5* is more than 0.05 level of error, the null hypothesis is accepted and we could say that there is no significant difference between the stock price in Dhu al-Qaʿdah and that of the other months. Given the proposed average values in Table I, we could say that the stock price in the Iraq Stock Exchange in Dhu al-Qaʿdah is roughly less than that of the other months. In addition,

as the obtained p-value of *H5* is less than 0.05 level of error, the null hypothesis is rejected and we could say that there is a significant difference between the stock price in Dhu al-Qaʿdah and that of the other months. Given the proposed average values in Table I, we could say that the stock price in Dhu al-Qaʿdah is decreased compared with that of the other months.

What is worth mentioning is that the ARIMA (0, 1, 1) time-series is deemed appropriate for fitting one; however, for *H3*, the ARIMA (1, 0, 0) time-series is deemed appropriate for model fitting. To fit the model for the rest of the hypotheses, the ARIMA (0, 0, 0) time-series is deemed appropriate.

Conclusion

The research hypotheses indicated that the stock index in Muḥarram, Rajab, Dhu al-Qaʿdah and Dhu al-Ḥijjah is different from that of the non-sacred months. The results indicated that there is no significant difference between the stock price in these months and that of the others. However, in Iran, there was a significant difference between the stock price in Rajab and Dhu al-Qaʿdah with other non-sacred months, but such a difference was not observed in the other two sacred months and the non-sacred months. In other words, results suggested that the changes of lunar months from sacred to non-sacred do not lead to significant alterations in the stock price of the stock exchange.

This shows that Iranian and Iraqi people do not make remarkable changes in their transactions in the stock market and no significant alteration would happen in the stock price. The results of this paper are in line with that of the Bazazan *et al.* (2014), Sinaei and Mohammadi (2012), Rogalski (1984), Alexakis and Xanthakis (1995), Coutts and Sheikh (2002), Al-Hajieh *et al.* (2011), Bialkowski *et al.* (2012a), Al-Atiyat (2014), Borowski (2015), Iqbal and Roy (2015) and Bahloul *et al.* (2017).

Given the results of the study, we recommend that stock exchange investors should not invest in Muḥarram in both the countries because the stock index in this month is significantly different from that of the other months, which is probably not because of real market activities.

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Table I.
Descriptive statistics

Month	Variable	Minimum	Maximum	Mean	SD
Muḥarram	Iraqi stock price (million dinars)	1,301.332	6,393.399	6,393.399	2,161.365
	Iranian stock price (million rials)	562,562.241	4,317,309.620	4,317,309.620	1,558,878.896
Rajab	Iraqi stock price (million dinars)	87.124	9,480.221	9,480.221	3,653.257
	Iranian stock price (million rials)	470,995.903	8,808,046.358	8,808,046.358	3,725,234.634
Dhu al-Qaʿdah	Iraqi stock price (million dinars)	870.147	4,266.028	4,266.028	1,422.915
	Iranian stock price (million rials)	859,580.670	2,362,669.579	2,362,669.579	601,022.564
Dhu al-Ḥijjah	Iraqi stock price (million dinars)	2,978.226	12,864.739	6,047.479	3,907.207
	Iranian stock price (million rials)	511,896.078	4,374,227.584	1,658,607.498	1,558,814.795
Other months	Iraqi stock price (million dinars)	2,231.546	21,041.538	6,965.271	7,910.481
	Iranian stock price (million rials)	860,853.478	3,226,821.097	1,760,039.670	1,030,108.022

Table II. The estimation of ARIMA model parameters hypotheses

Variable	COEFF (*H1*)	COEFF (*H2*)	COEFF (*H3*)	COEFF (*H4*)	COEFF (*H5*)	COEFF (*H6*)	COEFF (*H7*)	COEFF (*H8*)
Iraq								
Muḥarram effect	−4.833	–	–	–	–	–	–	–
Stock price effect	10,000	–	–	–	–	–	–	–
Rajab effect	–	–	−21.029	–	–	–	–	–
Stock price effect	–	–	10e9	–	–	–	–	–
Dhu al-Qaʿdah effect	–	–	–	–	−508,403**	–	–	–
Stock price effect	–	–	–	–	10,000	–	–	–
Dhu al-Ḥijjah effect	–	–	–	–	–	–	−420,877	–
Stock price effect	–	–	–	–	–	–	10,000	–
Iran								
Muḥarram effect	–	−21.029	–	–	–	–	–	–
Stock price effect	–	10e9	–	–	–	–	–	–
Rajab effect	–	–	–	−10.54	–	–	–	–
Stock price effect	–	–	–	0.853e10	–	–	–	–
Dhu al-Qaʿdah effect	–	–	–	–	–	−22.4577*	–	–
Stock price effect	–	–	–	–	–	1e10*	–	–
Dhu al-Ḥijjah effect	–	–	–	–	–	–	–	−21.57
Stock price effect	–	–	–	–	–	–	–	1e + 10

Note: *and **refers to statistical significance at 95 and 90% respectively

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