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# **How Religiosity Shapes Investor Behavior: Sukuk Issuances During Ramadan**

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## **Abstract**

We use an original identification strategy to isolate a potential religious bias in traders' behavior. We first analyze the stock market reaction to *sukuk* issuance and then isolate the religious component of the trades by comparing the stock market reaction to *sukuk* and bond issuance during the holy month of Ramadan. We use the event study methodology to measure abnormal returns for a sample of 2,140 issuances by 133 issuers in Malaysia over the period 2000-2013. We find that *sukuk* issuance during Ramadan is valued more positively than bond issuance by stock market investors. We observe that the type of securities previously issued by the firm influences the stock market reaction, in the sense that the positive reaction to *sukuk* issuance during Ramadan rewards firms which only issue *sukuk*. Our findings support the view that religiosity influences the behavior of investors, suggesting that religiosity should be taken into account in the analysis of financial markets.

**JEL Codes:** G14, P51.

**Keywords:** religion, Islamic Finance, Ramadan effect, behavioral finance.

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## I. INTRODUCTION

Religion has long been considered an important factor shaping economic institutions (Stulz and Williamson, 2003), market outcomes (Kumar, Page and Spalt, 2011) and people's economic behavior (Guiso, Sapienza, and Zingales, 2003). Recent works in finance also show that religiosity exerts an impact on financial conduct, e.g., through loan repayment (Baele, Farooq, and Ongena (2014) and the role of moral incentives in the repayment of short-term facilities (Bursztyn et al., 2015).

The role of religiosity in financial markets—where the majority of traders are professional investors—is more uncertain. The literature suggests that investors are subject to psychological biases when making investment decisions (Daniel, Hirshleifer, and Teoh, 2002; Barberis and Thaler, 2003) and that trading experience reduces but does not eliminate behavioral biases in financial markets (Feng and Seasholes, 2005). However, religious bias in financial markets has not been investigated yet, due to the lack of information on trades that are motivated by religious beliefs and the difficulty to isolate them from other investments. Our aim in this paper is to determine whether religiosity impacts the trading of securities in financial markets. In countries with both a conventional and an Islamic financial market, listed companies have the choice of issuing conventional bonds or *sukuk* to meet their large-scale financing needs. *Sukuk* are alternative modes of financing to conventional bonds that are compliant with the Islamic legal code. The religious content of *sukuk* makes them rather unique financial instruments to examine how religiosity influences the behavior of stock market investors.

To isolate a potential religious bias of investors in stock markets, we follow a twofold identification strategy. First, we compare the stock market reaction to *sukuk* issuance during and outside the holy month of Ramadan. This month is characterized by fasting, reading the Qur'an in its entirety, engaging in spirituality by intensifying prayers, and making donations to the needy. Further, the fast-breaking meal at the end of each day often takes place with a large number of family members and as such involves many interactions with fellow believers. Against this background, the month of Ramadan can influence individual views and beliefs by favoring religiosity, including financial decisions. Since Islam has specific prescriptions for financial ethics, Ramadan may thus foster religiosity which, in turn, leads investors to place more value on Islamic instruments.

However, Ramadan can also favor a different reaction from investors due to a well-being effect. This month of fasting can be associated with holidays and thereby generating a positive sentiment around its occurrence. Furthermore, the well-being of individuals may be enhanced during Ramadan because of a daily routine that includes pre-dawn and fast-breaking meals, which are social events combining family and friends (Campante and Yanagizawa-Drott, 2013).

Hence, our strategy should isolate the religious aspect of the Ramadan period from its “well-being” component. To that end, we compare the stock market reaction to the issuance of *sukuk* with that of conventional bonds, which are distinct financial instruments (Cakir and Raei, 2007; Godlewski, Turk-Ariss, and Weill, 2013), during Ramadan. The rationale is that the *difference* in the market reaction to *sukuk* and bonds issuance during the Ramadan can be attributed to the religious component of the *sukuk* instrument, after all relevant financial factors are taken into account. Hence, our identification strategy allows us to isolate the religious part of the trade.

To investigate the market impact of religiosity, we use an event study methodology. We measure the abnormal stock returns of listed companies in Malaysia that issued *sukuk* and bonds between 2000 and 2013, during and outside the Ramadan. We use Malaysia as the empirical fieldwork, as this country has by far the largest market for *sukuk*, gathering 86.8% of the industry size worldwide (KFUPM, 2016). Moreover, Malaysia has also the second deepest bond market in emerging countries relative to its GDP (Rohini, 2015). We then examine the stock market reaction following issuances of *sukuk* and bonds during Ramadan and for other months using univariate and multivariate analyses. Our main contribution to the literature is isolating the religious component of traders’ behavior. Through our identification strategy, we are able to provide evidence for a sizeable impact of religiosity on the stock market.

Our work has important implications for investors by providing information on the influence of religiosity on the behavior of market participants. It also examines the weight of religious aspects in Islamic finance and the ensuing fact that firms may strategically use financial instruments to select investors from a religious angle. Last, it informs on the ability of management to time the market when it comes to fixed income issuance, as the literature has shown that calendar effects can play a significant role in the firm’s value.

The remainder of the paper is organized as follows. The next section provides the background to the research question. Section 3 discusses the dataset and the methodology. Section 4 contains the results. Section 5 concludes.

## II. BACKGROUND

Our study is at the intersection of two strands of literature: behavioral biases on financial markets and Islamic finance. We therefore review papers that have addressed both topics.

### A. From Behavioral to Religious Biases

Behavioral finance postulates that people’s beliefs challenge the efficiency of financial markets. There is a debate in the literature over the extent to which financial agents act in an irrational way. Building on persistent patterns in stock returns, Daniel, Hirshleifer, and Subrahmanyam (1998), Daniel, Hirshleifer, and Subrahmanyam (2001) propose a model that

accounts for market inefficiencies stemming from behavioral biases. Opposing this approach, Fama (1998) emphasizes the role of misinterpretations, data-mining, and model errors in the results backing market inefficiency. Subsequent papers fall short of explaining the roots of persistent over or underpricing. For instance, Kothari, Lewellen, and Warner (2006) find evidence supporting market efficiency, whereas Zhang (2006), Kumar (2009) support behavioural biases.

To overcome this deadlock, the literature progressively used more precise proxies for behavioural biases. Coval and Shumway (2005) investigate the behaviour of traders on the Chicago Board of Trade with trading-level data and find that traders recording losses in the morning take higher risk in the afternoon. Feng and Seasholes (2005) also find evidence for a disposition effect, *i.e.* the reluctance of investor to realize losses and the propensity to realize gains, a result that is however challenged by Ben-David and Hirshleifer (2012). Bailey, Kumar, and Ng (2011) find that funds investors suffer from important biases and can be described as “Gambler, Smart, Overconfident, Narrow Framer, and Mature”.

Overall, the literature documents evidence of behavioural biases in financial markets. Looking for the roots of these biases, the role of culture and ultimately religion are often put forward. However, proxies for religiosity of investors are usually not directly available. For instance, Kumar, Page, and Spalt (2011) investigate the impact of religion on investors’ behaviour through geography, using the share of Catholics and Protestants in the US states. They do find that investors from states with relatively more Catholics invest more in lottery-type stocks and use more stock-options. However, their approach suffers from identification issues with a controversial geographical proxy, and the fact that religious and cultural effects can hardly be disentangled.

Some recent papers address these issues using the framework of Islamic finance. Baele, Farooq, and Ongena (2014) link the religious prescriptions of Islamic finance with the rate of loan defaults in Pakistan. Comparing Islamic and conventional loans and using more precise geographical proxies, such as the political vote and the number of Islamic schools in neighbourhoods, they observe that religiosity reduces the default rate. Bursztyn et al. (2015) conduct a field experiment on Islamic credit cards and show that religious incentives in the reminder of payments exert a strong impact on the refunding rate on short-term facilities.

Whereas there is nascent evidence in the literature of a religious bias in the repayment of retail loans, the role of religiosity on traders’ behaviour has not been investigated yet. Some papers examined the returns on stock markets during specific religious periods. Seyyed, Abraham, and Al-Hajji (2005) study the volatility of stock returns in the Saudi Arabian stock market during 1985-2000 and find that market volatility is lower during Ramadan. Bialkowski, Etebari and Wiesniewski (2012) investigate stock returns during Ramadan for 14 countries with a major share of Muslim population over the period 1989-2007, observing higher stock returns and reduced volatility during Ramadan in comparison with the rest of the

year. Bialkowski et al. (2013) also find that the performance of institutional fund managers in Turkey is substantially higher during Ramadan than in other months.

Turk-Ariss, Rezvanian, and Mehdian (2011) extend the analysis by testing for a month-of-the-year and day-of-the-week effect on stock market returns in Gulf Cooperation Council countries over the period 1994-2008. In addition to Ramadan, they also consider the possible influence of months of the Gregorian calendar on stock returns. Moreover, they test for a Friday-type effect by considering potential anomalies for Wednesday in these countries, because Wednesday is the last day before the weekend on the main market of the region, the Saudi Arabian stock market. As a consequence, a Wednesday effect is not related to Islamic calendar anomalies but rather to investor optimism at the end of the work week. They find support for a Wednesday effect, which is less pronounced during the month of Ramadan. They also observe lower volatility of stock market returns during Ramadan.

Al-Khazali (2014) analyzes the Ramadan effect for the stock returns of 15 Muslim countries with stochastic dominance approach over the period 1995-2012. He documents a positive Ramadan effect on stock returns in most countries, although its magnitude has been diminished with the financial crisis.

Halari et al. (2015) examine Islamic monthly anomalies on the Pakistani stock market, finding greater stock returns during four months including Ramadan but which are nonetheless not significant for most firms. However, they also document significantly lower stock volatility during two months including Ramadan, concluding that Ramadan is the best month for an investor to make a risk-adjusted profit.

Hence, the literature concurs that returns on stock markets are different during the month of Ramadan. However, these anomalies cannot necessarily be linked to religion but may derive from the well-being of investors, similar to the findings for Western countries where calendar anomalies are well-documented and which have nothing to deal with religiosity.<sup>1</sup> Henceforth, we offer an identification strategy to extract any religious component in the stock market using both the Ramadan period as well as Islamic and conventional finance.

## **B. Islamic Finance and *Sukuk***

Islamic finance can be defined as finance that conforms to Islamic law (*sharia*). *Sharia* imposes several requirements on financial instruments. The main one is the prohibition of interest in all financial transactions, which does not imply that capital is not rewarded. Instead, interest is replaced by the concept of profit-and-loss sharing, where both parties in a

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<sup>1</sup> For instance, January and end-of-the-week effects. See Gultekin and Gultekin (1983), Jaffe and Westerfield (1985) and Ariel (1987) for seminal references.

financial transaction share the returns from an investment. Another aspect of Islamic finance is the prohibition of activities considered as sinful by *sharia*, including investment in alcohol, pork, cigarettes, military, and entertainment.

There has been a strong expansion of Islamic financial activities in the recent years. According to TheCityUK (2015), Islamic financial assets have reached \$2.2 trillion end 2015, and have tripled since 2007. While the vast majority (80%) of these assets is accounted for by Islamic banks, *sukuk* represent about 15%. *Sukuk* are alternative modes of financing to conventional bonds that are compliant with *sharia*. They are investment certificates issued by sovereigns and corporations that combine similarities and differences with conventional bonds.

Like bonds, *sukuk* have a maturity date and their holders expect to receive a regular stream of income including capital refunding at the end of the investment horizon. These similarities can explain why some scholars consider that *sukuk* are not different instruments than conventional bonds (e.g., Miller, Challoner and Atta, 2007, and Wilson, 2008).

Unlike bonds, however, the value of *sukuk* may be either based on the creditworthiness of the issuer or rely solely on the underlying project. *Sukuk* certificates correspond ownership rights in tangible assets, usufruct, or services of revenue-generating issuers, with the underlying asset being *shari'a*-compliant. In a typical *sukuk* structure, a special purpose vehicle (SPV) buys the assets underlying the firm's investment project by raising funds from investors who receive ownership certificates. These certificates entitle the holders a regular stream of cash-flows and capital redemption at maturity. The project is managed by the issuer who can buy the underlying assets back. The aim of this structure is to give ownership of the underlying assets to the investors, thereby rendering the *sukuk* in conformity with the *sharia*.

*Sukuk* can be structured as debt-based instruments or partnership contracts. Debt-based instruments such as *ijara* (rental/lease agreement) and *murabaha* (cost-plus sale) do not contain *stricto sensu* interest but they pay a predetermined rate of return to investors. *Musharaka* and *mudaraba* are partnership contracts in which the provider of funds and the issuing company share profits based on pre-agreed ratios. Losses are commensurate to the contribution to the partnership in the case of the *musharaka* and otherwise entirely supported by the investors in the case of the *mudaraba*.

The large expansion of *sukuk* in the last decade raises questions about the impact of *sukuk* issuance for the issuing firm. In particular, the influence of *sukuk* financing on firm valuation is important to appraise the expansion of this nascent type of financing, as a more positive stock market reaction to *sukuk* issuance favors the choice of this financing instrument relative to bonds. Two studies provide evidence on the comparative stock market reaction to the announcements of both *sukuk* and conventional bonds.

Godlewski, Turk-Ariss, and Weill (2013) find that, in Malaysia, the stock market is neutral to the announcement of conventional bonds but investors react negatively to the announcement of *sukuk*, notwithstanding excess demand from Islamic financial institutions that makes it easier to sell these instruments. The negative implications of *sukuk* issues are attributed to possible adverse selection considerations, as borrowers with the lowest return expectations may favor the issuance of profit-and-loss sharing *sukuk* structures over conventional interest-based bonds.

Using a sample of *sukuk* issues across eight countries, Godlewski, Turk-Ariss, and Weill (2016) take the analysis a step further by examining whether the *sukuk* type and characteristics of *shari'a* scholars (advisors who certify *shari'a* compliance of *sukuk*) influence the stock market reaction to issuances. They find that both the choice of *sukuk* structure and scholars hired for its certification influence the stock market reaction to issuances.

Thus, existing papers provide evidence for a different stock market reaction to *sukuk* and bond issuance, as well as a role for *sukuk* characteristics. This conclusion opens the possibility that *sukuk* and bond issuances are impacted differently by some features. It therefore appears of interest to investigate if religiosity of investors can exert a role in the reaction to *sukuk* issues.

### III. EMPIRICAL STRATEGY

#### A. Data

We use data on bonds and *sukuk* issued by listed companies in Malaysia between 2000 and 2013. Malaysia was successful in developing both bond and *sukuk* markets, with the *sukuk* outstanding amount representing 54% of the total bonds outstanding in 2015.<sup>2</sup> It is of interest to stress that the *sukuk* market in Malaysia is characterized by an overwhelming amount of debt-based *sukuk*: *murabaha* and *ijara sukuk* account respectively for 66% and 7% of total *sukuk* in 2015, whereas the shares of *musharaka* and *wakala sukuk* are 12% and 10%, respectively. The remaining 5% is a combination of different contracts.

We retrieve data come from the Bloomberg Professional Server, considering only public straight debt issuances and removing hybrid securities. We get a preliminary sample of 5,706 issuances, of which 3,000 are *sukuk* issuances. Our final sample size is determined by data availability and methodology considerations. First, we only keep issuances for which the issuer has minimum financial records. We drop issuers with lack of information for sales, assets, book value of debt, and earnings for the year of the issuance. For the market analysis,

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<sup>2</sup> Information provided by the Securities Commission website: <http://www.sc.com.my/data-statistics/islamic-capital-market-statistics>. Last view 17/05/2016.

we need stock pricing 171 days before issuance to 21 days after it, and we remove issuers without enough stock market data. To prevent any overlapping between events, we also remove issuances from the same issuer that occur within 10 working days. Last, since we need to distinguish clearly between bond and *sukuk* issuances as part of our identification strategy, we remove issuances by the same firm of both types of securities that occur on the same day.

Our final sample includes 2,140 issuances by 133 corporate issuers. More precisely, 83 listed Malaysian firms issued *sukuk* and 79 issued bonds, with some firms issuing both types of securities. We identify issuances occurring during the month of Ramadan, by collecting the dates of Ramadan in Malaysia since 2000, relying on Malaysian official records.<sup>3</sup>

Table 1 describes the sample distribution across the Ramadan period, years, and sectors of economic activity. We observe 96 bond issues and 111 *sukuk* issues during Ramadan, compared with 935 bond issues and 998 *sukuk* issues, respectively, for the full sample. Hence, the proportion of issues during Ramadan is proportional to the length of this period for bonds (40 days out of 365), whereas there is proportionally slightly more issues of *sukuk* during Ramadan than during the rest of the year.

The number of issuances has steadily increased since the year 2000, but this trend was reversed with the global financial crisis, and the market has not returned to the pre-crisis level of issuances reached in 2007. The majority of securities issuances are from the industrial sector followed by banks, but firms engaged in the consumer segment are also significant players in the market.

Table 2 reports descriptive statistics for the characteristics of issuances and issuers. We keep all debt maturities in our sample, resulting in an important dispersion in the sample. We observe that there are significant differences between bonds and *sukuk*, suggesting that these two instruments may be different. Bond issuances are larger, on average, than *sukuk* issuances, paying slightly lower coupon rate for a shorter maturity. However, there is no statistical difference in the size of both types of issuers. However, both types of issuers appear to be of similar size. Bond issuers have a greater leverage and a better profitability than *sukuk* issuers. In the multivariate analysis, we take into account the different features of issuers and issues.

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<sup>3</sup> <http://www.islam.gov.my/en/node/26745>

## B. Methodology

To investigate the impact of Ramadan on *sukuk*, we perform an event study on the stock market reaction around *sukuk* and bond issuance. We adopt the standard event study methodology as described by MacKinlay (1997) to compute abnormal returns (AR) around the issue date.

We first estimate expected returns from a market model, such as:

$$R_{n,t} = \alpha_i + \beta_n \cdot R_{m,t} + \varepsilon_{n,t} \quad (1)$$

$R_{n,t}$  is the daily return of the share price of the company  $n$  the day  $t$ , and is computed as  $R_{n,t} = \frac{P_{n,t} - P_{n,t-1}}{P_{n,t-1}}$ , where  $P_{n,t}$  is the closing price.  $R_{m,t}$  is the market return and  $\varepsilon_{n,t}$  is the abnormal return over the estimation period, with  $E[\varepsilon_{n,t}] = 0$  and  $Var[\varepsilon_{n,t}] = \sigma_i^2$ .

We collect data on four main indices which may be used to calculate market returns in Malaysia.<sup>4</sup> We choose the index with the highest  $R^2$ , namely the FTSE Bursa Malaysia Emas Index (FBMEMAS), which is a weighted index of large and mid-cap companies.

We use an estimation period of -171 days to -21 working days before the *sukuk* or bond issuance to prevent any impact or contamination from the current issuance. This also allows us to systematically compute expected returns outside the Ramadan period (which lasts 29 days on average).

Next, we compute the abnormal returns as follows:

$$AR_{n,t} = R_{n,t} - E[R_{n,t}] \quad (2)$$

Where the expected return  $E[R_{n,t}]$  is calculated from the market model in the main analysis as:

$$E[R_{n,t}] = \widehat{\alpha}_n + \widehat{\beta}_n \cdot R_{m,t} \quad (3)$$

We allow the market to anticipate the event and to take one more day to fully integrate its impact. Hence, we consider the day before and after the event too, corresponding to a  $[-1, 1]$  window.

We then compute Cumulative Abnormal Returns (CARs) such as:

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<sup>4</sup> Namely, the MSCI Malaysia Index (MSDLMAF), the FTSE Bursa Malaysia Top 100 Index (FBM100), the FTSE Bursa Malaysia KLCI Index (FBMKLCI) and the FTSE Bursa Malaysia Emas Index (FBMEMAS). A popular index is also the FTSE Bursa Malaysia Emas Sharia Index (FBMS) including *shar'ia*-compliant firms only. However we do not consider this last index since we want a religious-neutral index for both *sukuk* and bond issuers.

$$CAR_n(\tau_1, \tau_2) = \sum_{t=\tau_1}^{\tau_2} AR_{n,t} \quad (4)$$

With  $\tau_1$  the first day of the window and  $\tau_2$  the last day. We also calculate the average  $CAR$  across companies, such as:

$$\overline{CAR}(\tau_1, \tau_2) = \frac{1}{N} \sum_{n=1}^N CAR_n(\tau_1, \tau_2) \quad (5)$$

To assess the significance of  $AR$ s and  $CAR$ s we perform three complementary tests. First, we perform a cross-sectional t-test ( $t^{CS}$ ) which considers only the variance within the event windows:

$$t_{(\tau_1, \tau_2)}^{CS} = \frac{\overline{CAR}(\tau_1, \tau_2)}{\sqrt{\left[ \frac{1}{N-1} \sum_{i=1}^N (\overline{CAR}_i(\tau_1, \tau_2) - \overline{CAR}(\tau_1, \tau_2))^2 \right]}} \quad (6)$$

The cross-sectional statistic is most suited to investigate calendar anomalies. Notably, Bialkowski et al. (2012) use it to find that volatility is lower during Ramadan. The reason is that the cross-sectional t-test takes into account a potential change in the variance of returns between the estimation and the observation period.

To provide an alternative statistic, we compute the Boehmer, Masumeci, and Poulsen (1991) statistic ( $t^{BMP}$ ), which considers the variance of the stock returns both outside and within the observation period. To this end, we first calculate the variance of  $AR$ s over the estimation period ( $\sigma_{i,\varepsilon}^2$ ). Then, each  $CAR$  is standardized by the variance of the estimation period, resulting in standardized cumulative abnormal returns ( $SCAR$ ) such as:

$$SCAR_i(\tau_1, \tau_2) = \frac{CAR_i(\tau_1, \tau_2)}{\sqrt{(\tau_2 - \tau_1 + 1) \cdot \sigma_{i,\varepsilon}^2}} \quad (7)$$

Next, the  $t^{BMP}$  statistic is obtained by dividing the cross-sectional average  $SCAR$  by its cross-sectional standard deviation during the event period:

$$t_{(\tau_1, \tau_2)}^{BMP} = \frac{\frac{1}{N} \sum_{i=1}^N SCAR_i(\tau_1, \tau_2)}{\sqrt{\left[ \frac{1}{N-1} \sum_{i=1}^N (SCAR_i(\tau_1, \tau_2) - \frac{1}{N} \sum_{i=1}^N SCAR_i(\tau_1, \tau_2))^2 \right]}} \quad (8)$$

Last,  $CAR$ s are often characterized by an important dispersion with extreme reactions. We perform a sign test over the percentage of negative  $CAR$ s to be sure these reactions do not drive our findings.

In a second part, we aim to isolate the impact of Ramadan on stock market reaction to issuances. We perform OLS regressions using  $CAR$ s over the  $[-1, 1]$  event window as the dependent variable. Our key explanatory variable is *Ramadan*, which is a dummy variable set to one if the issue takes place during Ramadan and zero otherwise. We also interact this variable with the dummy variable *Sukuk*, which is equal to one if the issuance is a *Sukuk* and

zero otherwise. Hence, we are able to isolate the effects of Ramadan on the stock market reaction.

We capture the religiosity effect in regressions that include *Sukuk*, *Ramadan*, and *Sukuk*×*Ramadan* as right-hand side variables. The coefficient on *Sukuk* depicts the general differential stock market reaction to *sukuk* issuance relative to bond issuance. A significant coefficient for *Ramadan* would imply that this month has an influence of the stock market reaction following issuances of bonds only. Indeed, if *Sukuk* is equal to 1, the effect of issuing a *Sukuk* during Ramadan is integrated in the interaction term *Sukuk*×*Ramadan*. If the issue is a bond, the interaction term is equal to zero and the variable *Ramadan* integrates the effect of issuing a bond during Ramadan. Last, the interaction *Sukuk*×*Ramadan* corresponds to the specific stock market reaction following *sukuk* issuance relative to bond issuance during Ramadan. In other words the coefficient on *Sukuk*×*Ramadan* considers the impact of the religiosity of investors on the *sukuk*, which is the key dimension that we investigate in this paper. The overall impact of Ramadan on stock market reaction following *sukuk* issuances is the sum of the coefficients on *Sukuk*, *Ramadan*, and for *Sukuk*×*Ramadan*.

To control for other determinants of CARs, we also include issuance and issuer characteristics. We select two issuance characteristics: the amount of issuance in USD measured in log (*Amount*), and the maturity of the issuance in years (*Maturity*). We also consider five issuer characteristics: issuer size defined by the log of sales (*Size*), *Market-to-Book*, *Leverage* as the ratio of total debt to total assets, *Current Ratio* as the ratio of current assets to current liabilities, and *Profitability* measured as the ratio of earnings before interest and taxes (Ebitda) to total assets. We include year fixed effects and industry fixed effects.

#### IV. RESULTS

We first display the univariate results, followed by the multivariate estimations. We then provide additional investigation by considering separately unique and multiple issuers before concluding with robustness checks.

##### A. Abnormal Returns during Ramadan

Univariate results are displayed in Table 3. We report summary statistics for CARs around security issuances of bonds and *sukuk*, by distinguishing issuances taking place during or outside Ramadan.

We first point out the absence of a Ramadan effect as a whole for all security issuances. Our findings do not provide evidence for a significantly different stock market reaction to security issuance during the month of Ramadan.

We also find that *sukuk* issuance generates a negative stock market reaction that is significant using the cross-sectional statistic when the issuance takes place outside Ramadan. However,

the market reaction is insignificant when the issuance occurs during Ramadan. This first result is of interest because it tends to show a Ramadan effect for *sukuk*. This calendar effect may have several explanations at this point. First, issues during Ramadan may be of higher quality for shareholders. This argument calls for a multivariate analysis controlling for the issues' and issuers' characteristics. Second, a Ramadan effect may also stem from behavioral biases. This period may be more pleasant for shareholders since it corresponds to a period of celebration, with numerous public holidays, and social interactions. Alternatively, a greater religiosity during that month may contribute to improve the perception of issuers using financial instruments which are compliant with *sharia*. So far, we cannot disentangle these effects and need to dig deeper in our investigations.

Next, we observe that CARs following bond issuance are significantly negative for issuances taking place during Ramadan, while they are not significant for issuances outside Ramadan. This significance observed using the cross-sectional statistic may yield three explanations. It could be that issues are of poorer quality during Ramadan, which is a period with fewer trading days. Alternatively, this period may be more stressful for shareholders, as people may be more irascible, have frequent headaches, and suffer from a privation of sleep during the Ramadan (Leiper and Molla, 2003). Last, greater religiosity during that month may contribute to deteriorating the perception of issuers of financial instruments that are non compliant with *sharia*.

Therefore, the univariate analysis shows evidence of a Ramadan effect for bond and *sukuk* issuances in opposite directions. The stock market reaction deteriorates for bond issuance, but it improves following *sukuk* issuance as the occurrence of Ramadan cancels the negative impact of *sukuk* issuance during other months. The fact that the effect of Ramadan is opposite for bonds and *sukuk* adds some weight to the religious interpretation of financial market reaction. A priori, there is no *financial* reason explaining that management chooses to issue bond of poor quality and *sukuk* of high quality during Ramadan. Similarly, there is no reason explaining a difference in the well-being effect between the two securities during Ramadan. So far, these findings suggest that religiosity during Ramadan bears an influence that leads investors to favour *sukuk* issues and dismiss bond issues. We explore this hypothesis further in a multivariate analysis framework.

## B. Multivariate Estimations

Multivariate results for the Ramadan effect are reported in Table 4. We perform several regressions of CARs. We first include the single effect of *Sukuk* without considering the Ramadan period, controlling for a set of variables (Column 1). We then investigate the Ramadan effect as a whole by including *Ramadan* and the same control variables (Column 2). The following estimations consider together the three dummy variables *Sukuk*, *Ramadan*, and *Sukuk*×*Ramadan* to provide information on a Ramadan effect for *sukuk* issuance, and testing for three different specifications to examine how the set of control variables can

influence the results. Column 3 includes no control variable, column 4 considers only issuance variables, and column 5 has all issuance and issuer variables.

In the first column, we find no significant coefficient for *Sukuk*, meaning that no significant difference in stock market reaction is observed following *sukuk* issuance relative to bond issuance. This result differs from the conclusion of a negative stock market reaction found by Godlewski, Turk-Ariss and Weill (2013), which could be explained by the use of more recent data in our sample going until 2013 while theirs stopped in 2009. The development of *sukuk* markets may have influenced their perception by stock market investors.

When testing for the presence of a Ramadan effect for all security issuances in column 2, we do not find a significant coefficient for *Ramadan* either. Hence we confirm the univariate results of the absence of a Ramadan effect for security issuances in general.

We then turn to the key part of the estimations by analyzing the Ramadan effect for *sukuk* issuances in the last three columns of the table. We observe that the coefficient on Ramadan is negative and significant when considering the effect of *sukuk*. At the same time, the coefficient on the interaction term *Sukuk*×*Ramadan* is positive and significant.

As we include the dummy variable for *sukuk* issuance and the interaction term between *sukuk* issuance and Ramadan issuance, the coefficient for *Ramadan* informs on the impact of a bond issuance during Ramadan. Hence the negative coefficient for *Ramadan* means that bond issuance during the month of Ramadan generates a negative stock market reaction relative to bond issuances taking place during the rest of the year.

The positive and significant coefficient for *Sukuk*×*Ramadan* informs on the difference in the market reaction to bond and *sukuk* issued during Ramadan. We find that *sukuk* issuance during Ramadan is valued more positively than bond issuance by stock market investors. Since we control for issue and issuer characteristics and consider the overall *sukuk* effect with the dummy variable *Sukuk*, the difference between bond and *sukuk* during Ramadan can be related to the sole effect of religiosity on investor reaction during that period.

This result is a key finding because it shows that some part of traders' behavior is determined by religious considerations. The religious component of the shareholders' reaction (*Sukuk*×*Ramadan*) is also significant from an economic standpoint, since it represents an abnormal return of 1.6%, which is substantial for the firm. Using the mean capitalization of companies issuing *sukuk* during Ramadan, the religious component of the trade represents USD9.876 million of stock value in abnormal return due to religiosity. In a similar fashion, issuing *sukuk* during Ramadan instead of outside Ramadan would generate an additional

USD11.576 million of stock value.<sup>5</sup> Therefore, not only has religiosity an impact on traders' behavior, but its impact is also economically significant.

What is the overall impact of issuing *sukuk* during Ramadan? The *F*-test of the sum of the coefficients for *Sukuk*, *Ramadan* and *Sukuk*×*Ramadan* is not significant. In other words, to issue *sukuk* during Ramadan does not have a significant impact on stock market reaction. *Sukuk* seem to benefit from shareholders' religiosity, which outweighs the negative effect observed for bonds during Ramadan. This is confirmed by the sum of *Ramadan* and *Sukuk*×*Ramadan* which is positive and significant: adding only the religious part of the reaction to the general reaction to *sukuk* issues yields a positive reaction.

How to explain this negative effect for bonds issues occurring during Ramadan? The coefficient *Ramadan* only represents the reaction to bonds during Ramadan and does not compare this effect with *sukuk* issues. Hence, two competitive hypotheses arise since this effect may be attributed to both a well-being effect and a religious effect. First, shareholders may be stressed by the Ramadan period, reducing their well-being and leading to a negative reaction. Second, shareholders may sanction firms which choose to issue bonds, *i.e.* to use a security which contradicts with the *sharia*, during a holy period. Since we cannot disentangle this religious and well-being effect for bonds, we allow for the possibility that the two effects exert a role on shareholders' reaction.

In a nutshell, bonds and *sukuk* generate a different reaction during Ramadan. Shareholders react negatively to bonds during Ramadan, whereas they do not have any reaction to *sukuk* in general. As for the significant difference in reaction between bond and *sukuk* during the Ramadan, it can be attributed to shareholders' religiosity. Traders value the religious component of *sukuk* with a sizeable abnormal return, but they may punish bond issuers for the issuance of interest-based securities.

### C. Unique vs. Multiple Issuers

When considering a reward of religion-based securities and a punishment of interest-based debt, it is of interest to explore what happens to firms that issue solely *sukuk* or bonds compared with those that tap both markets. In line with the reward / punishment interpretation, the reaction of stock market investors can be influenced by the usual behavior of issuers. The reward should be higher for firms that commit to the *sukuk* market solely. Conversely, firms that usually tap both markets may be not impacted by the religiosity of shareholders. The reason is that the expectations of investors are not the same for both situations. Investors expect a *sukuk*-only issuing firm to commit to the *sukuk* market and they

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<sup>5</sup> For comparison, Malaysia had a market capitalization of roughly USD500bn in 2013 (World Bank Data Base) <http://data.worldbank.org/indicator/CM.MKT.LCAP.CD/countries>

may reward it for its commitment, unlike for firms that usually tap both markets. To investigate this hypothesis, we distinguish between unique issuers, or firms that have only issued one type of securities until the concerned issue, and multiple issuers, i.e. firms that have issued both types of securities in the past.

Table 5 displays the estimations considering separately single issuers and multiple issuers. For each category of issuers, we provide results with three alternative sets of explaining variables: the three key variables (*Sukuk*, *Ramadan*, *Sukuk*×*Ramadan*) only, the three key variables and the issuance variables, and the three key variables alongside all control variables.

The most striking result is that our main findings of a significantly negative coefficient for *Ramadan* and a significantly positive coefficient for *Sukuk*×*Ramadan* are maintained for single issuers only. Namely, both these variables are not significant for multiple issuers. In other words, our key finding that bonds and *sukuk* generate a different reaction during Ramadan only stands for single issuers.

Shareholders react positively to *sukuk* issuance during Ramadan only if the issuer has loyally issued solely *sukuk* in the past. Hence, this abnormal return can be directly seen as a reward for firms' commitment to *sukuk* issuances. In contrast, the estimations show that no specific market reaction occurs for multiple issuers during the month of Ramadan. This result comforts the idea that investors of firms that do not select only one market but tap indifferently both the *sukuk* and bond markets do not take into account the religious part of the security.

#### D. Robustness Checks

We check the robustness of our results using three different tests reported in Table 6, considering the full set of explanatory variables for all tests.

First, we use an alternative event window for cumulative abnormal returns. We redo our estimations by considering one day before the event and the day of the event solely. This corresponds to the  $[-1,0]$  event window instead of the  $[-1,1]$  event window in the main estimations. We observe that the interaction term *Sukuk*×*Ramadan* is still positive and significant. However *Ramadan* is no longer significant. Hence, we still observe a significant difference between bond and *sukuk* during Ramadan, with a positive impact from *sukuk* and no significant influence from bonds.

Second, we use a modified model instead of the market model. Since our sample is characterized by numerous issuances from few firms, the market model can be misspecified if the estimation period includes too many events (Brown and Warner, 1985). In this case, the expected return is equal to the market return. We find that *Ramadan* is not significant and that the interaction term *Sukuk*×*Ramadan* is no longer significant albeit remaining positive.

Third, we use an alternative market index to compute stock market returns. We replace the FBMEMAS by the FBM100, which is the market index with the highest  $R^2$  after the FBEMAS among the four main indices for which we collected data. Our main findings are maintained. We observe a significantly negative coefficient for *Ramadan* and a significantly positive coefficient for *Sukuk* $\times$ *Ramadan*. Hence the results confirm a negative influence of Ramadan for bond issuances and a positive one for *sukuk* issuances on stock markets.

## V. CONCLUSION

This paper investigates if a religious bias may affect trades on a stock market. We develop an identification strategy to isolate the potential religious component of a trade, examining how the month of Ramadan can affect the stock market reaction following the issuance of *sukuk* relative to conventional bonds. We use an event study methodology for the largest corporate *sukuk* market in the world in Malaysia.

Ramadan provides a framework of prime interest to investigate the behavior of traders because it fosters religiosity with the greater incentives for spirituality during that month. It can consequently exert an influence on the perception of *sukuk* which are in line with Islamic prescriptions. However, the Ramadan period may also exert a role on investors' well-being, as it corresponds to a period of festivity. We isolate the religious component during Ramadan by comparing the stock market reaction to *sukuk* issues to the reaction to conventional bonds issues.

We find support for an impact of religiosity on stock returns. Univariate results show that cumulative abnormal returns are not significant when a *sukuk* issuance takes place during Ramadan, while they are negative when issuance occurs during the rest of the year. Hence, there is a positive effect of the month of Ramadan on stock returns following a *sukuk* issue. This result is of particular interest as the abnormal returns during the month of Ramadan are negative for bond issues.

Multivariate results show that Ramadan exerts a positive stock market reaction for *sukuk* relative to bonds. The difference of reaction between both securities during the month of Ramadan can then be attributed to the religious component of *sukuk*. In contrast, bond issues during Ramadan are followed by a negative stock reaction. This reaction can either be attributed to a negative well-being effect or a punishment for firms issuing an interest-based security during a holy period.

To check if the reaction following *sukuk* or bond issues during Ramadan corresponds to reward or punishment, we conduct further investigation based on the former behavior of the issuing firm. We compare firms which commit to one type of security to firms which use both. We find that investors react positively to *sukuk* issuance during Ramadan only if the issuer has loyally issued only *sukuk* in the past. If the issuer usually taps both markets, there

is no religious bias in the reaction of traders to the *sukuk* issue.

Our findings support the view that religiosity can influence the behavior of investors. This result confirms that psychological biases affect the value of financial securities. Moreover, our identification strategy does not rely on a proxy of religion but directly assess the religious component of a trade. Second, we also show that one major difference between *sukuk* and bonds lies in the religious nature of these instruments in the eyes of the investors. As a consequence, management may be able to choose strategically to issue *sukuk* or conventional bonds to attract investors. Last, we also show that the management should carefully select the timing of issues, since it has a substantial impact on the firm value. Depending if they anticipate a reward process or not from investors, they could select the month of Ramadan to issue *sukuk* or stick to other months to issue bonds.

This paper opens avenues for further research. It represents a first investigation on how calendar anomalies can influence stock market reaction following security issuance. Future work could examine the effect of Islamic religious events for other countries, as well as other calendar anomalies like day-of-the-week or month-of-the-year effect in the Gregorian calendar for security issuances.

**Table 1**  
**Sample Distribution of Issues Across Period, Years, and Industries**

The table gives the composition of the sample by day, year, and industry. The sample is composed of 133 issuers with 83 firms having issued *Sukuk* and 79 firms having issued bonds (some firms issue both securities).

	Bond Issues	Sukuk Issues
<b>Period</b>		
<i>During Ramadan</i>	96	111
<i>Outside of Ramadan</i>	935	998
<b>Years</b>		
2000	12	3
2001	16	4
2002	7	5
2003	10	12
2004	86	92
2005	110	131
2006	134	213
2007	161	215
2008	132	186
2009	116	80
2010	107	56
2011	65	63
2012	36	34
2013	39	15
<b>Industries</b>		
Basic Materials	74	87
Communications	44	22
Consumer, Cyclical	184	169
Consumer, Non-cyclical	135	249
Diversified	47	7
Energy	5	4
Financial	233	180
Industrial	274	379
Utilities	35	12
<b>Total</b>	<b>1031</b>	<b>1109</b>

**Table 2**  
**Descriptive Statistics by Security Type and by Issuer**

The table presents issuances and issuers' characteristics, distinguishing bond and *sukuk* issuances. All variables are in million USD with the exception of maturity (months), issue price (%), coupon (%) and financial ratios (%). The stars denote the significance of t-test difference (mean) and Kruskal-Wallis median test between bond and *sukuk* (\*p<0.1, \*\*p<0.05, \*\*\*p<0.01).

	N	Mean	Median	Std. Dev.	Minimum	Maximum
<b>Issuances</b>						
<i>Bond Issues</i>						
Amount	1031	28.1**	10.5***	111	0.3	2200
Issue price	418	98.3***	99.1***	6.9	13.9	100
Coupon	1031	0.6	0	1.8	0.0	9
Maturity	1031	0.8*	0.2*	1.9	0.0	18
<i>Sukuk Issues</i>						
Amount	1109	20.3**	7***	56.9	0.5	854
Issue price	588	99.2***	99.5***	1.3	74.3	102
Coupon	1109	0.7	0	1.9	0.0	9
Maturity	1109	1*	1.5*	2.3	0.0	22
<b>Issuers</b>						
<i>Bond Issuers</i>						
Size	223	687	170.6	1261.2	2.3	6499
Market-to-Book	223	1.4	0.9	2.4	-0.2	28
Leverage	223	36.5**	34	13.4	0.5	72
Current ratio	223	1.7	1.3**	1.3	0.0	12
Profitability	223	9.1*	8	7.2	-12.1	46
<i>Sukuk Issuers</i>						
Size	256	815.2	186.9	1808.8	4.1	15319
Market-to-Book	256	1.3	0.9	1.0	-0.1	7
Leverage	256	33.9**	32.2	13.2	1.6	80
Current ratio	256	1.9	1.5**	1.4	0.2	12
Profitability	256	8.1*	7.8	5.4	-18.0	25

**TABLE 3**  
**Cumulative Abnormal Returns**

The table presents cumulative abnormal returns (CARs) around issuance announcement by issuance type. CARs are presented in percentage points. We use a market model with an estimation period lasting from -171 to -21 days before the issuance. We report cross-sectional  $t$  ( $t_{CS}$ ) and Boehmer, Masumeci, and Poulsen (1991)'s  $t$  ( $t_{BMP}$ ). For the percentage of negative observations, we perform a sign test. Stars denote significance (\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ ).

	N	CAR	$t_{CS}$	$T >  t_{CS} $	$t_{BMP}$	$T >  t_{BMP} $	Negative (%)
<i>Window [-1,1]</i>							
Full Sample	2140	-0.19	-1.84*	0.07	-0.38	0.71	54.22***
<i>During Ramadan</i>	207	-0.37	-0.88	0.38	-0.68	0.5	56.99*
<i>Outside of Ramadan</i>	1933	-0.18	-1.63	0.1	-0.23	0.82	53.93***
Sukuk	1109	-0.22	-1.59	0.11	-0.56	0.57	56.2***
<i>Sukuk Ramadan</i>	111	0.23	0.41	0.69	0.01	0.99	62.04**
<i>Sukuk Not Ramadan</i>	998	-0.27	-1.93*	0.05	-0.58	0.56	55.54***
Bond	1031	-0.16	-1.03	0.3	0.13	0.9	52.02
<i>Bond Ramadan</i>	96	-1.07	-1.72*	0.09	-1.17	0.25	50.59
<i>Bond Not Ramadan</i>	935	-0.07	-0.43	0.66	0.41	0.68	52.16

**Table 4**  
**Main Estimations**

The table presents the regression results where cumulative abnormal returns is the dependent variable. The key explanatory variables are *Sukuk* (which takes the value one if the issuance is a *sukuk*), *Ramadan* (equal to one if the issuance is during Ramadan), and their interaction *Sukuk*\**Ramadan*. The regression also includes issuance and issuer characteristics. Dummy variables for sectors and years are included but not reported. The variances are clustered at the issuer level. T-values are in parentheses and stars denote the significance (\* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ ).

	(1)	(2)	(3)	(4)	(5)
<i>Sukuk</i>	-0.015 (-0.06)		-0.122 (-0.59)	-0.095 (-0.46)	-0.163 (-0.72)
<i>Ramadan</i>		-0.199 (-0.51)	-1.062* (-1.80)	-1.076* (-1.84)	-1.061* (-1.80)
<i>Sukuk</i> × <i>Ramadan</i>			1.601** (2.17)	1.618** (2.21)	1.606** (2.20)
Amount	-0.023 (-0.20)	-0.022 (-0.20)		0.045 (0.44)	-0.014 (-0.13)
Maturity	-0.049 (-1.49)	-0.050 (-1.48)		-0.054 (-1.60)	-0.053 (-1.60)
Size	0.171 (1.63)	0.171 (1.64)			0.169 (1.61)
Market-to-Book	0.006 (0.11)	0.005 (0.08)			0.002 (0.03)
Leverage	-0.010 (-0.75)	-0.010 (-0.75)			-0.010 (-0.75)
Current ratio	0.192*** (3.87)	0.191*** (3.72)			0.192*** (3.89)
Profitability	0.047 (1.43)	0.047 (1.49)			0.047 (1.44)
Constant	-1.600 (-0.68)	-1.534 (-0.63)	-0.992 (-0.69)	-1.324 (-0.55)	-1.552 (-0.64)
<hr/>					
<i>Sukuk</i> + <i>Ramadan</i> + <i>Ramadan</i> × <i>Sukuk</i>			0.416	0.447	0.381
F			0.781	0.899	0.624
<i>Ramadan</i> + <i>Ramadan</i> × <i>Sukuk</i>			0.539	0.542	0.545
F			1.527	1.546	1.584
<i>Sukuk</i> + <i>Ramadan</i> × <i>Sukuk</i>			1.479*	1.523**	1.442*
F			3.649	3.958	3.905
<hr/>					
N	2140	2140	2140	2140	2140
N of issuers (clusters)	133	133	133	133	133
R <sup>2</sup>	0.0140	0.0141	0.00843	0.00881	0.0164
F	4.804***	4.392***	2.004***	2.087***	4.268***

**Table 5**  
**Unique and Multiple Issuers**

The table presents the regression results where cumulative abnormal returns is the dependent variable. The sample is divided between unique issuers (firms which have only issued one type of security in the five previous years) and multiple issuers. Dummy variables for sectors and years are included but not reported. The variances are clustered at the issuer level. T-values are in parentheses and stars denote the significance (\*p<0.1, \*\*p<0.05, \*\*\*p<0.01).

	<i>Unique Issuers</i>			<i>Multiple Issuers</i>		
	(1)	(2)	(3)	(1)	(2)	(3)
<i>Sukuk</i>	-0.035 (-0.15)	-0.027 (-0.12)	0.027 (0.11)	-1.157 (-1.19)	-1.005 (-1.11)	-0.987 (-1.03)
<i>Ramadan</i>	-1.604** (-2.15)	-1.596** (-2.16)	-1.623** (-2.14)	-0.173 (-0.15)	-0.332 (-0.30)	-0.260 (-0.21)
<i>Sukuk</i> × <i>Ramadan</i>	2.065* (1.87)	2.052* (1.87)	2.087* (1.88)	1.342 (1.05)	1.479 (1.16)	1.404 (1.05)
Amount		-0.064 (-0.60)	-0.141 (-1.29)		0.340 (1.10)	0.359 (1.17)
Maturity		0.004 (0.08)	0.005 (0.08)		-0.107 (-0.79)	-0.145 (-0.94)
Size			0.201* (1.91)			0.359 (0.95)
Market-to-Book			0.030 (0.52)			-0.319 (-1.34)
Leverage			-0.011 (-0.69)			0.0175 (0.69)
Current ratio			0.202** (2.52)			0.107 (0.89)
Profitability			0.075** (2.02)			-0.033 (-0.56)
Constant	-0.488 (-0.84)	0.615 (0.33)	-1.369 (-0.74)	-1.642 (-1.20)	-7.677 (-1.30)	-9.959 (-1.67)
<i>Sukuk</i> + <i>Ramadan</i> + <i>Ramadan</i> × <i>Sukuk</i>	0.426	0.429	0.491	0.0114	0.143	0.157
F	0.248	0.252	0.309	0.001	0.0215	0.0261
<i>Ramadan</i> + <i>Ramadan</i> × <i>Sukuk</i>	0.461	0.456	0.464	1.169**	1.147*	1.144**
F	0.325	0.316	0.336	4.233	4.073	4.298
<i>Sukuk</i> + <i>Ramadan</i> × <i>Sukuk</i>	2.030*	2.025*	2.114*	0.184	0.475	0.417
F	3.031	3.037	3.366	0.150	0.528	0.319
N	1426	1426	1426	467	467	467
N of issuers (clusters)	105	105	105	33	33	33
R <sup>2</sup>	0.0140	0.0142	0.0272	0.0399	0.0428	0.0482

**Table 6**  
**Robustness Checks**

The table presents three robustness regressions for the Ramadan specification by changing the dependent variable. Column 1 uses an alternative window, [-1,0]. Column 2 presents an alternative computation of expected returns, using a modified model (*CAR Modified*), with a [-1,1] window. Last, column 3 uses an alternative index to compute CAR, FBM100 (*CAR FBM100*). Dummy variables for sectors and years are included but not reported. The variances are clustered at the issuer level. T-values are in parentheses and stars denote the significance (\*p<0.1, \*\*p<0.05, \*\*\*p<0.01).

	(1)	(2)	(3)
	CAR[-1,0]	CAR Modified	CAR FBM100
<i>Sukuk</i>	-0.197 (-0.82)	-0.313 (-1.63)	-0.154 (-0.67)
<i>Ramadan</i>	-0.954 (-1.54)	-0.693 (-1.54)	-1.085* (-1.84)
<i>Sukuk</i> × <i>Ramadan</i>	1.467* (1.88)	0.903 (1.60)	1.592** (2.17)
Amount	-0.072 (-0.80)	0.112 (1.61)	-0.020 (-0.19)
Maturity	-0.0346 (-1.13)	0.002 (0.04)	-0.052 (-1.60)
Size	0.126 (1.35)	0.061 (0.59)	0.172 (1.63)
Market-to-Book	0.040 (0.66)	0.009 (0.21)	0.002 (0.03)
Leverage	-0.0140 (-1.15)	0.007 (0.87)	-0.009 (-0.71)
Current ratio	0.125*** (2.96)	0.084** (2.02)	0.189*** (3.83)
Profitability	0.055** (2.04)	0.011 (0.51)	0.048 (1.48)
Constant	-1.029 (-0.43)	-3.475* (-1.80)	-1.736 (-0.71)
N	2140	2140	2140
N of issuers (clusters)	133	133	133
R <sup>2</sup>	0.0102	0.0193	0.0166
F	4.388***	3.133***	4.206***

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