How Sukuk Shapes Firm Performance[#]

Paul-Olivier Klein
University of Strasbourg
Strasbourg, France

Laurent Weill[+]
EM Strasbourg Business School, University of Strasbourg
Strasbourg, France

Christophe J. Godlewski
University of Haute Alsace & EM Strasbourg Business School
Strasbourg, France

Abstract

With the large expansion of Islamic finance in the recent years, *sukuk*, which are the Sharia-compliant substitute to conventional bonds, are now becoming more prominent. The aim of this study is to examine the impact of *sukuk* issuance on firm performance. To do so, we analyze how stock market performance and operating performance are influenced by issuance of *sukuk* and bonds on a sample of Malaysian listed companies. We consider the short-term and medium-term stock market reaction through the computation of cumulative abnormal returns and buy-and-hold abnormal returns. We investigate the impact on operating performance by performing regressions and by calculating abnormal operating performance so that we can compare how issuance affects similar firms. We find that *sukuk* issuance generates a negative stock market reaction both in the short-term and in the medium-term. We also find evidence that issuing *sukuk* hampers operating performance. The analysis of abnormal operating performance shows that *sukuk* issuers have better performance than their matched bond issuers, but that *sukuk* contributes to reduce the gap in performance over time. Overall our results support the view that *sukuk* issuance hampers stock market performance, but that it is not attributable to a signaling effect on the bad financial situation of the issuer. We interpret our findings as evidence of adverse selection taking place on the financed projects and agency problems stemming from the specific *sukuk* structuring with stock market investors more reluctant to invest in *sukuk* issuers.

JEL Codes: G14, P51.
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1. Introduction

There was an impressive development of Islamic financial activities in the world in the last decade, with worldwide Islamic financial assets rising from USD 150 billion in the mid-1990s to USD 1.8 trillion by end of 2013.[1] This trend has been driven by the growth of Islamic banking activities but also by the expansion of *sukuk*. By end of 2013 worldwide value of outstanding *sukuk* was USD 270 billion, representing 14.6% of global Islamic financial assets.

What are *sukuk*? They are the alternative mode of financing to bonds that is compliant with the Islamic law (*shari'a*). *Sukuk* are investment certificates which can be issued by companies and countries, with similarities and differences with bonds. Like bonds, *sukuk* have a maturity date and provide income flows over the life of the security with a payment at maturity to their holders. Unlike bonds, the value of *sukuk* is not based on the creditworthiness of the issuer, as holding *sukuk* shares represents the ownership in tangible assets, usufruct, or services of revenue-generating issuers. As a consequence, *sukuk* prices can vary both with the creditworthiness of the issuer and with the market value of the underlying asset.

Sukuk can be structured like 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 financier and the entrepreneur share profits based on pre-agreed ratios whereas losses are commensurate to their contribution to the partnership.

Given the expansion of *sukuk*, it appears as a surprise that research remains scarce on this issue. Godlewski, Turk-Ariss, and Weill (2013) use an event study methodology to compare the stock market reaction to the announcements of *sukuk* and bond issues of companies in Malaysia. They find that the stock market reaction is neutral to the announcement of bonds but that investors react negatively to the announcement of *sukuk*. The negative implications of *sukuk* issues are attributed to two reasons. First, an adverse selection mechanism can be at work, as borrowers with the lowest return expectations may favor the issuance of profit-and-loss sharing *sukuk* structures over conventional interest-based bonds. Second, there is an excessive demand for *sukuk* coming from Islamic institutions. As a result,

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[1] All figures on Islamic finance activities come from Kuwait Finance House (2014)

it can be easier for a firm to issue and sell *sukuk* relative to bonds. Issuing *sukuk* would then be interpreted as a way to obtain financing when the company is unable to issue a bond.

Godlewski, Turk-Ariss, and Weill (2016) prolong this work by examining the impact of two key features of *sukuk* on the stock market reaction: the type of *sukuk*, and the certification by *shari'a* scholars. *Sukuk* must be certified by these scholars to guarantee their compliance with *shari'a*. By performing the analysis on a sample of eight countries, they find that debt-like *sukuk* favor a positive stock market relation in comparison to partnership contracts. This result is observed in particular for *Ijara sukuk*, the most commonly used *sukuk* structure. They explain this finding by the lower *shari'a* compliance risk of *Ijara* compared to other structures but also by the adverse selection mechanism that hampers the issuance of profit-and-loss sharing *sukuk*. They also show that the choice of scholars can influence the stock market reaction to *sukuk* issuance.

Our objective is to extend these works by providing a broader analysis of the impact of *sukuk* issuance on the performance of the issuing firm. Godlewski, Turk-Ariss and Weill (2013) have analyzed the stock market reaction to *sukuk* issuance but they restrict their study to the short-term stock market performance. We can however wonder if issuing *sukuk* exerts an influence on medium-term stock market performance and on operating performance. The analysis of the medium-term stock-market reaction is of use to check if the negative stock market reaction persists over time.

By examining operating performance, we have a better view of all consequences of the issuance of *sukuk* for a firm. In line with the theoretical arguments on the influence of debt issuance on firm performance, we can check if *sukuk* issuance exerts a similar impact than bond issuance. The study of operating performance helps also understanding the reasons of the negative stock market reaction following *sukuk* issuance. Namely the negative stock market reaction to *sukuk* issuance suggests that stock market investors consider this event as bad news for the evolution of the firm performance. To issue *sukuk* would act as a signal of the bad financial shape of the issuer, in line with the adverse selection argument stressed before. Alternatively, it can also contribute to deteriorate the situation of the firm if such event is more costly than the issuance of a bond.

To answer these questions, we perform for the first time a broad analysis of the impact of *sukuk* issuance on firm performance. We consider a sample of 114 Malaysian listed companies that issued 164 *sukuk* (47 issuers) and 604 bonds (67 issuers) from 2002 to 2010. Our focus is on Malaysia, as this country is by far the world's biggest country of issuance for corporate *sukuk*. In addition, the volume of issued corporate bonds is substantial and allows a

comparison between the issuance of corporate *sukuk* and bonds. The focus on the Malaysian market also allows avoiding the influence of tax rules between *sukuk* and bonds, as taxation rules for *sukuk* in Malaysia aim at guaranteeing the fiscal neutrality between both types of instruments.[2]Understanding how *sukuk* issuance influences firm performance has major interest for the analysis of *sukuk* markets. It contributes to explain the stock market reaction by analyzing how the operating performance of the firm evolves after the issuance. Namely, stock market performance is supposed to be influenced, notably, by the expected evolution of operating performance. So by looking simultaneously at the stock market and the operating performances, we bring a comprehensive view of the investor perception. It also provides some perspectives on the evolution of *sukuk* markets, as investor valuation and influence on operating performance can affect the decisions of firms to issue *sukuk*.

Our empirical analysis is composed of four parts. First, we analyze the stock market reaction to *sukuk* and bond issuance to provide evidence on the stock market performance in the short-term. It is a first step in our analysis to check if the result from Godlewski, Turk-Ariss and Weill (2013) stands for our sample before examining how *sukuk* issuance influences operating performance and medium-term stock performance. Second, we calculate abnormal operating performance to study how issuance can affect operating performance of similar firms. We create pairs of similar firms with one *sukuk* issuer and one bond issuer. We can then examine if a *sukuk* issuer performs better than its matched bond issuer. Third, we examine how *sukuk* and bond issuance influences operating performance and thus may explain the first reaction of stock market investors. To do so, we perform regressions of operating performance indicators. We are then able to investigate if issuing *sukuk* leads to a deterioration of operating performance. In other words, we can check if the negative stock market reaction can be explained by the expectation that this event hampers the financial situation of the firm. Fourth, we examine medium-term stock market reaction to *sukuk* issuance. We then compute the buy-and-hold abnormal return to study the stock market reaction in the three years following the issuance.

The rest of the article is structured as follows. Section 2 presents theory and testable hypotheses. Section 3 describes the data. Section 4 presents the methodology. Section 5 provides the results. Section 6 concludes.

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[2] See for additional information the website of *Securities Commission Malaysia*: http://www.sc.com.my/general-section/special-incentives/islamic-capital-market/ and http://www.sc.com.my/general-section/special-incentives/bond-market/.

2. Theory and testable hypotheses

In this section, we explain why firm performance is differently influenced by *sukuk* or bond issuance. To this aim, we first develop the arguments why debt issuance should influence firm performance. Then we explain how these arguments can act in a different way following *sukuk* issuance in comparison to bond issuance.

2.1 Debt issuance and firm performance

Theoretical literature provides opposing arguments on the impact of debt issue on firm performance. Two hypotheses may explain a positive impact on firm performance. First, issuing debt is a signal solving adverse selection issues. Namely, information asymmetries between firm insiders and outsiders create an adverse selection issue. High-quality firms have then incentives to send a signal to show their quality. Debt represents a credible signal. Issuing a debt is more costly for firm's insiders in a low-quality firm than in a high-quality firm, due to the probability of default in case of bad performances (Leland and Pyle, 1977; Ross, 1977). Shareholders are then expected to react positively to a bond issue which reveals promising prospects for the firm's profitability.

Second, issuing debt contributes to reduce agency costs created by conflicts of interest between shareholders and managers. The separation of ownership and management creates diverging objectives between shareholders and managers, and as such contributes to favor moral hazard behavior of managers tempted to take actions that benefit themselves at the expense of firm value. This behavior can take place through waste of firm resources or through minimization of effort. In any case, it contributes to deteriorate firm value. However debt financing disciplines managers. It reduces the "free cash-flow" at the disposal of managers (Jensen, 1986): debt implies interest payment obligations that must be satisfied by firm managers as not satisfying firm obligations would lead to bankruptcy of the firm. It also strengthens the incentives of managers to perform well since they face personal costs in case of firm bankruptcy (Grossman and Hart, 1982). Hence the disciplining role of debt should favor positive stock market reaction and operating performance.

Two hypotheses can also be proposed to predict a negative influence of debt issuance on firm performance. On the one hand, issuing debt enhances agency costs created by conflicts of interest between shareholders and debtholders. Shareholders have incentives to act in their interests at the expense of debtholders. This divergence of interests can appear through

different forms. Shareholders can favor investment in riskier projects than those preferred by debtholders, with such "asset substitution" caused by the asymmetry of gains for shareholders (Jensen and Meckling, 1976).

On the other hand, debt issuance increases the probability of bankruptcy for the issuing firm. A greater leverage enhances the risk that a firm will not be able to meet its commitments. As such, debt issuance raises the likelihood of this event which represents losses for shareholders. But without going to the extreme situation of bankruptcy, greater leverage also enhances the probability of financial distress and then the costs associated with this situation.

2.2 Sukuk vs. bond issuance and firm performance: testable hypotheses

The above arguments explain how debt issuance can influence firm performance. We now present the main reasons why *sukuk* issuance can exert a different impact on firm performance than bond issuance. These reasons are related to the formerly presented arguments and to the features of *sukuk*.

Differences in structuring between *sukuk* and bonds can influence the expectations of stock market investors. *Sukuk* are vehicles for which the income given to holders is not generated by the issuing firm but by the asset on which *sukuk* is backed. Then the firm does not have interest repayment obligations and the rights of *sukuk* holders differ from those of creditors.

However, in the large majority of cases *sukuk* flows are paid by the issuer itself. For instance, for *Ijara sukuk* (rental / lease agreement), rental payments are often paid by the issuer through a *sale and lease-back* (El-Gamal, 2006). Similarly, for *Murabaha sukuk* (cost-plus sales), the issuer provides an income to the holders of the vehicle. In addition, the majority of *sukuk* includes ex-ante defined rates of return.

Once these elements on *sukuk* practice are given, we can gather the motives for a differentiated impact of *sukuk* issue on firm performance in three broad arguments.

First, *sukuk* can contribute to solve information asymmetries in a different way than bonds. A key principle of Islamic finance is profit and loss sharing. As a consequence, Islamic financial products are particularly sensitive to adverse selection and moral hazard behavior of borrowers. However all forms of *sukuk* do not follow this ethical principle. *Mudaraba* and *Musharaka* are partnership contracts which are fully compliant with profit and loss sharing

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principle. Nonetheless the majority of *sukuk* are based on debt-like forms, with the use of *Ijara* and to a lesser degree *Murabaha*.

However adverse selection is a major concern for partnership contracts. Profits and losses generated by the project are shared between investors. This type of financial instruments has advantages for firms in bad shape. Such firms have incentives to finance a very risky project with this type of contract. Symmetrically, good issuers have incentives to choose conventional financial contracts so that they can keep a greater share of generated profits.

Hence *sukuk* issuers can be low-quality firms. As a consequence, the issuance of *sukuk* would not help solving adverse selection. In other words, we should observe a negative stock market reaction to *sukuk* issue relative to bond issue, and also to a negative influence of *sukuk* issue on the operating performance of the issuer.

The negative market response to *sukuk* issue can even be strengthened by the oversubscription of *sukuk*. As stressed by Godlewski, Turk-Ariss and Weill (2013), we observe an excess demand for *sukuk* because of the coexistence of a strong demand from Islamic banks looking for liquid Sharia-compliant assets and of a limited supply of these instruments.

Second, *sukuk* issuance can generate different costs than bond issuance of two kinds. On the one hand, the costs of financial distress can differ between both types of issuance. These costs increase with debt issuance and as such contribute to a negative impact on firm performance. In theory, *sukuk* holders own the underlying asset. However practice shows that these rights can become uncertain in case of financial difficulties for the company, as pointed out by van Wijnbergen and Zaheer (2013) in recent cases. *Sukuk* makes more complex the rights of all investors during the liquidation of the company. As a consequence, costs of financial distress can be greater for *sukuk* issuers than for bond issuers.

On the other hand, to issue *sukuk* can be more costly than a bond issuance. *Sukuk* structuring requires several additional operations in comparison to the issuance of bonds. A special purpose vehicle has to be established, which has to be managed. All in all, Storck and Cekici (2011) have counted between twenty and thirty contractual documents for the issuance of *sukuk*. Each document needs also the compliance with the law of the country but also with *shari'a*, which creates greater legal costs for *sukuk* relative to bonds, even if financial differences between both types of securities are minor.

Both sets of arguments related to different costs for issuances are then in favor of a more negative stock market reaction following *sukuk* issuance than bond issuance in the short-term but also in the medium-term.

Third, the disciplining role of debt can differ when a firm decides to issue *sukuk* or bond. Some arguments support the view that the disciplining role of debt would be lower when *sukuk* is issued. On the one hand, *sukuk* is based on the establishment of a special purpose vehicle, which is legally independent of the issuer and does not mean tight return obligations as these returns are generated by the assets on which *sukuk* is backed. On the other hand, profit and loss sharing principle means that managers do not have obligations to pay interest payments not related to the returns of the company, and that they do not face the same personal costs in case of bankruptcy, given that sharing profits and losses means to risk of bankruptcy.

Thus managers should be less disciplined by debt when *sukuk* are issued, which would favor their moral hazard behavior at the expense of shareholders. As a consequence, firms using *sukuk* should choose investment projects with lower returns, leading to reduced profitability of *sukuk* issuers. We should also observe *sukuk*-issuing firms accumulating greater free cash flows. Then the reduction of the disciplining role of debt with *sukuk* issue could have a negative influence on the stock market and the operating performances of firms.

We have presented the reasons why *sukuk* issuance can have a different influence on the performance of the issuing firm than bond issuance. They motivate the five following hypotheses.

Hypothesis 1: the stock market reaction is more negative following *sukuk* issuance than following bond issuance.

Hypothesis 2: sukuk issuance has a negative impact on the operating performance of issuing firms.

Hypothesis 3: sukuk-issuing firms have worse operating performance than bond-issuing firms.

Hypothesis 4: sukuk issuance leads to retention of free cash flows by the issuer.

Hypothesis 5: medium-term abnormal returns of *sukuk* issuers are lower than those of bond issuers.

3. Data

We use data covering *sukuk* and bond issuances in Malaysia from 2002 to 2010, while accounting and stock data span from 2001 to end 2013. Data are extracted from the Bloomberg Professional Terminal Server (Bloomberg). The sample gathers 164 *sukuk* issuances and 645 bond issuances taking place between the 1st of January 2002 and the 31st of December 2010. By taking into account all maturities for securities on Malaysia debt market (*sukuk* and bonds), we extend the sample in comparison to Godlewski, Turk-Ariss and Weill (2013, 2016).The distribution of issues by industry and by year is displayed in Table 1. Table 2 displays descriptive statistics on our sample of securities classified by issue type. We can point out that bonds are on average larger than *sukuk*, and are associated with a longer maturity. A larger size for bond issues can be partly due to the fact that *sukuk* issues decrease in recent years whereas bond issues increase. It mechanically leads to a higher nominal value for bonds. Table 3 reports the descriptive statistics by issuer. The table reports the statistics by considering the year preceding the issue.

We have considered a period of five years for each issue, with the year preceding the issue, the issuance year and the three following years. To prevent any overlapping issue, the sample encompasses only issuers that issued only bonds or *sukuk* over the whole period of study. We have then a sample of 114 single issuers including 47 *sukuk* issuers and 67 bond issuers. Several striking facts emerge from the comparison of both types of issuers. First, *sukuk* issuers appear to have a smaller median size measured by their sales and to issue smaller amount than bond issuers. Second *sukuk* issuers have a higher market capitalization normalized to assets and a greater current ratio. Third, profitability is better for *sukuk* issuers. They have greater Ebitda to total assets (median) and ROA. Fourth, *sukuk* issuers display significantly lower free cash-flows. In a nutshell, the analysis of the firms issuing *sukuk* and bond shows that *sukuk* issuers do not have a worse financial situation for the year preceding the issue but rather tend to be in better financial shape.

4. Methodology

We perform four analyses to provide a broad view of how *sukuk* issue can influence the performance of the issuing firm.

First, we study the reaction of stock market investors following the issuing of a *sukuk* or a bond. In this aim, we compute the average abnormal return of the company in the days

surrounding the event. Our methodology to compute the abnormal return is standard in the literature (MacKinlay, 1997; Kothari and Warner, 2006). We estimate a market model. We use an estimation period of 90 working days from -11 to -100 days before the issuance. The daily abnormal return (AR) is then calculated as:

$$AR_{i,t} = R_{i,t} - E[R_{i,t}] = R_{i,t} - (\widehat{\alpha}_i + \widehat{\beta}_i . R_{m,t}) \qquad (1)$$

Where $R_{i,t}$ is the arithmetic stock return of the company i on the date t and $R_{m,t}$ is the arithmetic stock market return on t. The return is figured out from the stock closing price, each working day. We use the MSCI Malaysia Index, which aggregates the performance of middle and large capitalizations on the Malaysian stock market and includes 85% of public companies in Malaysia.[3] In order to capture all potential reactions of shareholders, we compute three different windows. First, we consider solely the event day, *i.e. t*=0, to gradually enlarge the observation window to one day, then two days, before and after the event ([-1,1] and [-2,2]). The reason to study the impact of the event before the issue date is to include a potential leakage of the information toward the shareholders before the official announcement. The cumulative abnormal return (CAR) for each company i is computed as:

$$CAR_{i,(\tau,T)} = \sum_{t=\tau}^{T} AR_{i,t} \qquad (2)$$

with τ the first day of the corresponding observation window and T the last day. For univariate studies, we calculate the arithmetic mean of the $CAR_{i,(\tau,T)}$ for the N firms of the sample. To prevent any overlapping of the data, issues taking place within ten days of interval have been removed from the sample.

We complete the analysis of the short-term market reaction by performing regressions of the CAR. The explained variable is the CAR, while the key explanatory variable is the dummy variable *Sukuk* that is equal to one if the issue is a *sukuk* and zero otherwise. Several control variables are included into the regressions. To control for issuance's characteristics we use issuance's *maturity, amount* and *coupon*. We then use variables for firm characteristics: logarithm of sales, *market capitalization* (total capitalization to total assets), *debt ratio* (total debt to total assets), *current ratio* and the *Altman Z-score* (as provided by Bloomberg). We also include dummy variables for industry and year of issuance. Standard deviations are clustered at the issuer level.

Second, we calculate the abnormal operating performance (AOP). This technique is based on pair-comparisons and is commonly used in the literature on the impact of an event

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[3] For robustness check, we also use four alternative indices: the FTSE Bursa Malaysia KLCI Index (the 30 first Malaysian capitalizations), the FTSE Bursa Malaysia Top 100 (100 first capitalizations), the FTSE Bursa Malaysia Emas Index (98% of Malaysian capitalizations) and the FTSE Bursa Malaysia Emas Sharia Index (which encompasses only the companies in line with Islamic finance requirements). We obtain similar findings.

on operating performance.[4] The reasoning is to match firms according to common features the year preceding the issue and then to compare both the difference of operating performance and its evolution the years following the issue. We consider two variables for profitability. First, we use the Earnings before Interest, Taxes and Depreciation scaled by total assets (*Ebitda*). This variable provides an indicator of operational performance before taking into account amortization policy and extraordinary performance and the influence of financial expenses. It then allows analyzing the impact on firm performance of bond or *sukuk* without being influenced by the potential difference in financial costs between both types of instruments. Second, we use the Return on Assets (*ROA*) to have an overall view of the firm performance, following the recommendations of Barber and Lyon (1996).

To test the free cash-flow hypothesis, we use the free cash-flows to the firm scaled by total assets (*FCF*). The issuers are matched in order to create homogenous couples, composed of one firm which issued a *sukuk* and one which issued a bond. Following Eberhart, Maxwell and Siddique (2004), the firms should be in the same industry and issue the debt security the same year. Then, it should be the closest firm in terms of size (measured by total assets) the year preceding the issuance in the sample (Nohel and Tarhan, 1998). Last, the couple is matched according to Ebitda the year preceding the issuance, since this indicator of performance is not polluted by past financial performances. For each criterion, the matching is carried out by minimizing the squared difference of the variable between both groups of firms (*sukuk* or bond issuers).

When the pairs are formed, the abnormal operating performance (AOP) of a *sukuk* issuer is the difference between its performance and its expected performance, *i.e.* the performance of its matched firm (who issued a bond). To capture growth dynamics, we follow Barber and Lyon (1996) who advocate to use the difference of the variation of performance. In this case, the expected operating performance (OP) of the firm i the year y becomes :

$$E(OP_{i,y}) = OP_{i,y-1} + (OP_{j,y} - OP_{j,y-1}) = OP_{i,y-1} + \Delta OP_{j,y} \qquad (3)$$

with j the matched firm (who issued a bond).

We generate a cumulative abnormal operating performance (CAOP) depending on the number of years following the event we were screening, namely up to three years. We compute both the mean and the median of AOP. This choice is motivated by the common observation in the literature that the median is more appropriate than the mean for the results

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[4] See among others Barber and Lyon (1996), Lie (2001), Eberhart, Maxwell, and Siddique (2004), Williams and Tang (2009) and Lemmon et al. (2014).

given the dissymmetry of the distribution of performance indicators (Barber and Lyon, 1996; Eberhart, Maxwell and Siddique, 2004; Lie, 2001).

Third, we analyze how issuance of *sukuk* and bonds can influence the operating performance of issuing firms. To do so, we perform panel regressions with random effects of the three operating performance indicators: Ebitda, ROA, and FCF. We cluster standard deviations at the issuer level. To study all the potential effects of the type of issue on the firm, we use all these variables from one to three years after the issue. As stressed by Williams and Tang (2009), the effects of an event may take some time to occur. To examine potential variation effects, we also compute the cumulative variations of these indicators during the three years following the event.[5] Thus we use accounting data spanning from 2001 (one year before issues for 2002) to 2013 (three years after issues for 2010). The key independent variable is *Sukuk* defined as a dummy variable equal to one in the case of a *sukuk* issuer and zero otherwise. We use the same set of control variables at the firm level than for explaining the CAR. We also add the total amount issued by the firm and the mean maturity for the corresponding year. Last, we include dummies to control for the sectors and years.

Fourth, we examine the medium-term abnormal stock returns of firms. We investigate if the immediate reaction of stock market investors is persistent over time, but also if the medium-term stock market performance of firms is consistent with their operating performance. We compute the buy-and-hold abnormal returns (BHAR) following the methodology of Lyon, Barber, and Tsai (1999). It was used by Ahmad-Zaluki and Wan-Hussin (2010), Ahmad-Zaluki and Wan-Hussin (2010) and How et al. (2007) among others. The BHAR can be defined as the difference between the realized and expected buy-and-hold benchmark. The BHAR of a firm *i* on the period (τ, T) is defined as:

$$BHAR_{i,(\tau,T)} = \left[\prod_{t=\tau}^{T}(1 + R_{i,t}) - 1\right] - \left[\prod_{t=\tau}^{T}(1 + E(R_{i,t})) - 1\right] \qquad (4)$$

Where $R_{i,t}$ is the arithmetic return of the firm *i* on the date *t* and $E(R_{i,t}) = R_{m,t}$, *i.e.* the arithmetic return of the market portfolio on the date *t*. The same indices than those adopted for computing CAR have been used to proxy the market portfolio. We define three observation periods (τ, T): (0,252), (0,504) and (0,756), namely one, two and three years in working days after the announcement date. We compute these returns relative to the MSCI Malaysia Index. Again, for the univariate analysis, we calculated the arithmetic mean of the $BHAR_{i,(\tau,T)}$ for the *N* firms of the sample. As for CAR, we perform regressions of BHAR with clustered standard errors at the issuer level to provide multivariate results.

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[5] For instance, the cumulative variation of the ROA of the firm *i* is generated as $\Delta ROA_i = \sum_{y=0}^{3}(ROA_{i,y} - ROA_{i,y-1})$, with $y = 0$ the year of the issue.

5. Results

5.1 Short-term stock market reaction

We begin the analysis by examining the stock market reaction to *sukuk* and bond issuance announcement. Table 4 displays the mean and median CAR by type of security issue (*sukuk* or bond). The analysis of the results for the full sample shows that the mean and median CARs of *sukuk* issues are significantly negative for all event windows, with the exception of the event window [0,0] for which the mean CAR is negative but not significant. In the case of bond issues, the mean CAR is not significant or significantly positive depending on the event window. These first results tend to suggest a more detrimental market response for *sukuk* issues than for bond issues which accords with evidence from Godlewski, Turk-Ariss and Weill (2013).

We then check if the stock market reaction is significantly different for a *sukuk* issue and a bond issue. The difference is always negative for all event windows and significantly negative for the event windows [-1,1] Hence these results tend to show that the stock market investors react differently to the type of issue.

To gain further insight, we examine if the stock market reaction to *sukuk* and bond issues is influenced by the period of study. Namely, our period includes the financial crisis as it goes from 2002 to 2010. We define the crisis period as year 2008 and 2009 in line with the fall of Malaysian GDP during both years. The results are displayed by splitting the full sample between both periods. We find a major difference between both periods. Before the crisis we find again that the difference is significantly negative between *sukuk* and bond issues in most cases. However during the crisis, we cannot conclude to a different perception of investors of both types of issues. Even if the difference is negative, it is not significant in all cases.

Thus our findings support the view that stock market investors have a different perception of *sukuk* and bond issues. Investors appear to be reluctant to invest in *sukuk* issuers in favor of firms opting for bond. Thus, a *sukuk* issuance consists in a particularly bad signal for investors.

We complete the analysis of the market response to *sukuk* and bond announcements by performing regressions of the CAR. The explained variables are the CAR[-1,1] and the CAR[-2,2], while the key explanatory variable is the dummy variable *Sukuk* that is equal to one if the issue is a *sukuk* and zero otherwise.

The results are presented in Table 5. When the full period is considered, *Sukuk* is negative and significant for both windows. So we can conclude to a different perception of stock market investors to *sukuk* and bond issues even once issuer and issue characteristics are controlled.

The results by distinguishing before and during the crisis do not provide any new insight. *Sukuk* is negative but not significant when dividing the sample between the issuance occurring during and outside the crisis. Stock market investors do not appear to react differently within or outside the financial crisis.[6]

Thus, the main conclusion of the analysis of the short-term reaction of stock markets is that *sukuk* issues lead to a negative reaction significantly different than bond. This conclusion is broadly supportive of the results reported by Godlewski, Turk-Ariss and Weill (2013) who find that the stock market reaction to *sukuk* issues can be negative. We then provide support to Hypothesis 1 according to which the stock market has a more negative reaction to *sukuk* issues than to bond issues.

5.2 Abnormal operating performance

We investigate how issuance of a *sukuk* or a bond can influence operating performance of comparable firms by computing abnormal operating performance (AOP) measures. We create homogenous pairs by matching *sukuk* and bond issuing firms one by one.

We have to remind that the use of AOP provides very different insights than the regressions of operating performance indicators when it comes to examine the impact of *sukuk* issuance. Regressions provide information on the impact after t years of *sukuk* issuance on operating performance. With AOP, we are able to analyze the difference in the joint evolution of two firms, with one issuing *sukuk* and the other issuing bond, with similar characteristics over the years. AOP then informs on the evolution over time of the operating performance of a *sukuk* issuer relative to similar firms and not only on the impact of *sukuk* issuance on operating performance. We can have a *sukuk* issuer performing better than its matched bond issuer, while at the same time we do not observe a positive link between *sukuk* issuance and operating performance, as regressions do not match similar firms.

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[6] We use a more conservative definition of outside financial crisis by removing the issues which occurred after the crisis (*i.e.* in 2010). It does not change the results.

Table 6 displays the results for the mean and median cumulative abnormal operating performance (CAOP) for the three years following the issue. The results are in percentage points for the difference with the matched firm, with a positive figure meaning a better performance of the *sukuk*-issuing firm. We use the Student test of mean and the non-parametric Wilcoxon test of median to check the significance of the difference. Two noteworthy results emerge.

First, we find support for a better performance of *sukuk* issuers relative to their matched firms. When considering AOP for one year to three years, we observe significantly better performance for *sukuk* issuers with ROA However, *sukuk* do not outperform bond issuers on operating performance with a non-significant difference in Ebitda. Second, we observe that *sukuk* issuers tend to have slightly higher (median) free cash flows than bond issuers.

Thus the main conclusion emerging from these results is the overall better operating performance for *sukuk* issuers than for firms issuing bonds. Moreover *sukuk* issuers appear to retain slightly more free cash flows.

Our results are based on the standard expectancy. However this computation mode is associated with inertia and does not allow detecting a slowdown in performance. A firm outperforming others can then be interpreted or considered as keeping or increasing the gap in performance. Following Barber and Lyon (1996), we consider next the difference of the variation in performance to take this issue into account.

We present also these results in Table 6. The main finding is the incremental reduction of the median difference for the variation in *Ebitda* and *ROA* during the second and third years following the issue. If *sukuk* issuers perform better than bond issuers, the difference in operating performance gradually decreases over time. *Sukuk* seems to act as if it slows down growth of *Ebitda* and *ROA*. On the contrary, the *FCF* increases during the second year, underlying once more some retention issues.

We can then provide a first explanation of the negative stock market reaction following *sukuk* issuance. Investors react negatively to the expected slowdown of performance resulting from the use of *sukuk* by firms, while the better performance of these firms issuing *sukuk* has already been reflected in their stock prices.

Our findings on AOP may also be influenced by the period of study. Namely the financial crisis can have influenced the impact of *sukuk* issuance on operating performance. As a consequence, we examine if the findings on AOP stand for both periods before and

during the crisis. We then compare the mean and median results for both periods. We define *sukuk* issuance to take place during the crisis if the issuance takes place in 2008 or 2009 again.

Our first finding of a better performance (ROA) of *sukuk* issuers relative to their matched firms is observed outside the crisis and during the crisis. As for the full sample, Ebitda proves to be non-significant. Our second finding is higher free cash flows for *sukuk* issuers the third year during the crisis. As for the full sample, we find no significant difference before the crisis.

We also compare the results for the variation in performance before and during the crisis to check if the dynamics of these indicators has changed between both periods. The main finding over the period was the incremental reduction of the median difference for the variation in ROA during the three years following the issue. We find evidence in favor of this result for the years outside the crisis. The positive gap in ROA for *sukuk* issuers is gradually reduced over time and the Ebitda is reducing too. However, during the crisis, the gap of the Ebitda is increasing, even if it eventually does not lead to a higher variation of ROA. Last, the gap of free cash-flows is widening outside the financial crisis.

All in all, our main findings on AOP, *i.e.* outperforming *sukuk* issuers are not influenced by the period of the study. They seem rather consistent over time and are not strongly affected by the financial crisis. On the other hand, the variation of the gaps is mainly driven by years outside the crisis period.

These findings do not contradict the observation of a better performance for *sukuk* issuers. They only show that this gap in performance is reduced over time following the issuance. This event seems to act as an obstacle for issuers to increase their performance.

The better performance we observe for *sukuk* issuers should not be overinterpreted. The computation of abnormal returns does not show better performance caused by *sukuk* issuance. The advantage in performance appears to exist before the issuance. Indeed, *sukuk* issuers present a higher ROA the year preceding the issuance and a higher Ebitda the year of the issuance. However the reduction of this gap in performance only occurs the years further to the issuance underlying a potential effect of *sukuk* issuance on the firm.

The fact that we observe a better operating performance for *sukuk* issuers is a finding of particular interest. As highlighted by Kuran (2004) and Godlewski, Turk-Ariss and Weill (2013), *sukuk* issuers could be less-healthy firms which prefer *sukuk* in the form of profit-and-loss sharing financing schemes over bond. The argument is that companies with low profit expectations do not opt for bonds with fixed repayments. Our evidence rejects the hypothesis

that firms in poor financial situation tend to prefer *sukuk*. Firms opting for *sukuk* are not the ones with worse financial condition. We even tend to find that they are in better financial situation than those opting for bonds when we compute AOP.

However the choice to issue *sukuk* contributes to deteriorate their short-term stock market performance and even their operating performance. We can then question the reasons of this choice, as they would have incentives to opt for bonds so that they can signal their better quality. We attribute this behavior to an adverse selection mechanism taking place on the projects and not on the issuing firms. Namely, firms with low-return project have incentives to opt for *sukuk* to finance this project because of the profit and loss sharing principle. As such, the use of *sukuk* would deteriorate the operating performance of the issuer. From the stock market perspective, the expectation that issuing *sukuk* will contribute to reduce operating performance leads to a negative stock market reaction.

Hence we reject Hypothesis 3 according to which *sukuk*-issuing firms have better operating performance than those opting for bonds. However, we support Hypothesis 4 that issuing *sukuk* would lead to retention of free cash flows by the issuers.

5.3 Operating performance

We have shown that stock market investors react differently to the announcements of *sukuk* and bond issues. To determine the interpretations of this finding, we investigate the impact of issuances of *sukuk* and bonds on operating performance of firms. We want to analyze if the stock market reaction is motivated by the expected impact of security issue on operating performance of the issuing firm. To this end, we perform regressions of operating performance measures. We consider the operating performance of the issuer 1, 2, or 3 years after the issue. We also examine the variation of the three indicators of operating performance between the year of issuance and three years later. We report the results of the estimations in Table 7 for performance indicators and Table 8 for free cash-flows.

Our main finding is that *sukuk* issuance tends to hamper operating performance. *Sukuk* coefficient has a negative and significant impact on ROA the third year following the issuance. We dig deeper this question by considering separately the periods before and during the crisis. We aim to check if the impact of *sukuk* issuance on operating performance differs with the period. We observe that the result of a significant and negative influence of *Sukuk* when explaining ROA only stands for the period outside the financial crisis. During the crisis, the effect proves to be non-significant.

To compare *sukuk* impact on performance with bonds' impacts, we also include in the panel regression a dummy for bond issuers and calculate the difference in coefficients. Bond issuance does not hamper operating performance. Moreover the difference in the impact of *sukuk* and bond on Ebitda is significantly negative for *sukuk* the second year outside the crisis. It appears that *sukuk* issuance tends to hamper operating performance whereas bond issuance does not exert any impact.

We also investigate the impact of *sukuk* issuance on free cash-flows. These results are displayed in Table 8. *Sukuk* issuance significantly increases free cash-flows of the firm the second and third year following an issuance. Moreover, it also fosters the pace of free cash-flows' retention over the three year. Once more, these results hold for the period outside the financial crisis.

The difference of *sukuk* and bond issuances impact on free cash-flow also proves to be significantly positive on the full sample. *Sukuk* issuance appears to increase cash-flows' retention whereas bond issuance does not impact free cash-flows.

Thus our main conclusion is that *sukuk* issuance hampers the operating performance of the issuer and generates retention of free cash-flows. Hypothesis 2 according to which it should deteriorate this performance is supported. Hypothesis 4 assuming that *sukuk* issuance generates retention of free cash flows by the issuer is also accepted.

5.4 Medium-term stock market reaction

To shed light on the impact of *sukuk* issuance on the medium-term stock performance, we use the buy-and-hold abnormal returns. This method is based on the measurement of the stock return of a firm to which we subtract the return of the market portfolio over a certain period. We consider three observation periods, namely one, two, and three years after the announcement.

Table 9 displays the medium-term abnormal returns. We observe significantly negative returns for *sukuk* issuers and significantly positive returns for bond issuers. More precisely, the abnormal return for a bond issue is positive and significant during the three years following the issue. For a *sukuk*, the abnormal return is negative on the second and third years. The difference in medium-term abnormal returns between *sukuk* and bonds appears to be significant over the whole period. The underperformance of *sukuk* issuers lasts for the three years following the issuance. Thus, the medium-term reaction of stock markets tends to be

similar to the short-term one: *sukuk* issuance generates a detrimental market response and firms perform worse than their counterparts for both horizons.

We interpret this result by the fact that *sukuk* issuers have a better operating performance but lowering over time, due to *sukuk* issuance. On the contrary, their greater operating performance the year preceding the issuance is already incorporated in their stock price. Hence, *sukuk* issuers have a negative stock market performance the years following the issuance.

We extend the analysis of medium-term abnormal returns by considering separately issuances taking place before and during the financial crisis. We observe that the results in difference are essentially the same outside and during the financial crisis.

A striking result is that the abnormal returns comparing to the market index are no longer significant for *sukuk* issuers during the financial crisis. We interpret it as the consequence of the strong decline of the index during the financial crisis. The difference between both issuers is however much higher than during the rest of the period, since bond issuers substantially outperform the index during the crisis. This finding is robust, as we observe it for the mean and for the median, and it persists for all three years of study.

This negative reaction suggests that stock market investors sanction Islamic financial whatever the period: they dislike it in normal time and prefer bond issuers during the financial crisis. This behavior may be driven by the peculiarity of these instruments.

These results are of particular interest for the debate on the resilience of Islamic finance during the financial crisis. Ho et al. (2014) finds evidence in favor of better resilience of Islamic finance during that period. This study is based on Islamic indices which have the key feature of including companies with low indebtedness. As a consequence, this dimension makes them more resilient in period of financial difficulties. However the majority of these companies do not participate actively to Islamic finance. The fact to belong to an Islamic index does not require some specific efforts of companies. In opposition, our study uses a sample of companies which have made a financial decision specifically Islamic by issuing *sukuk*. These companies have seen their stock returns shrinking with the crisis significantly more than the bond-issuing companies. Our results then complete those from Girard and Kabir Hassan (2008) who do not find any significant difference between Islamic indices and conventional indices.

We complete our univariate analysis with regressions of medium-term abnormal returns to check the robustness of our findings. The results are reported in Table 10. We obtain the same conclusions than for the univariate analysis. We find that the decision to issue *sukuk* does exert a significant negative impact on the returns the second and third years over the full period and outside the financial crisis. Hence, *sukuk* issuance proves to be detrimental to firm's stock performance, even when firm's and issuance's characteristics are taken into account.

The study of medium-term abnormal returns then provides support to the view that the medium-term stock market reaction to *sukuk* issuance is negative relative to bond issuance. Thus we find evidence to support Hypothesis 5 according to which *sukuk* issuers are lower medium-term abnormal returns than bond issuers.

6. Conclusion

In this paper we examine how *sukuk* issuance influences firm performance. We consider the impact on stock market and operating performances to provide a broad perspective of the effects of issuing *sukuk.*

We obtain several findings. First, we find that *sukuk* issuance generates a negative stock market reaction. We observe this conclusion for both the short-term and the medium-term stock market reaction. This result is consistent with the negative short-term market response found by Godlewski, Turk-Ariss and Weill (2013), but completes it for the medium-term horizon.

Second, we find that *sukuk* are issued by more profitable firms. However this better financial situation cannot be the result of the *sukuk* issue. *Sukuk* issuers are more profitable before the issue while the issuance lowers their operating performance. We also observe that *sukuk* issuers do not hold excessive free cash-flow before the issue but that *sukuk* issuance leads to retention of free cash-flows by the firm. Why would such firms take then the risk to issue *sukuk* and not to opt for bond to signal their quality and avoid bad performance? An interpretation is that slowdown companies without new outperforming investment projects head toward *sukuk*. The reason can be the oversubscription of these Islamic instruments, and the use of special purpose vehicle which does not directly hamper issuer's balance sheet if the project turns to be defective. An additional interpretation is the role of *sukuk* structuring which diminishes profitability of projects by enhancing costs and moral hazard through

retention of free cash-flows. In either case *sukuk* is a bad signal: it signals losing speed firms, with moral hazard issues and/or flawed projects or future flawed projects.

From a positive perspective, we contribute to have a better understanding of the reasons of the negative stock market reaction following *sukuk* issuance observed in the literature (Godlewski, Turk-Ariss and Weill, 2013). Our findings support the view that adverse selection does not take place at the firm level but at the investment project level. Namely *sukuk* are issued by losing speed firms with less profitable investment projects. These firms might hope that their positive financial reputation will cover this peculiar choice of debt. Thus, issuing a *sukuk* does signal this specific type of firm. Moreover, issuing *sukuk* directly hampers firm performance and increases agency problems. These effects can be attributed to the peculiar features of these instruments. All in all, our findings contribute to understand the implications of *sukuk* issuance and then of the expansion of *sukuk* markets.

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Table 1
Sample distribution of issuances by industry and by year

The table gives the composition of the sample by industry and by year.

	Bonds	*Sukuk*
Years		
2002	3	2
2003	8	5
2004	47	11
2005	70	22
2006	79	42
2007	99	37
2008	90	23
2009	143	9
2010	106	13
Sectors		
Basic Materials	29	15
Communications	18	0
Consumer, Cyclical	62	43
Consumer, Non-cyclical	116	8
Diversified	30	3
Energy	4	0
Financial	231	45
Industrial	133	47
Utilities	22	3
Total	645	164

Table 2
Descriptive statistics by issue type

The table provides the mean, median, standard deviation, minimum and maximum of issuances in the sample. Amount issued is in USD, issue price and coupon are in percent of the nominal, and maturity is in years. If the issuance includes several tranches, the amounts have been aggregated and the issue price, coupon and maturity have been aggregated with each tranche weighted by the amount of the tranche to the amount of the issue. The stars indicate significant differences for means (ttest) and medians (Kruskall-Wallis test) of the variables by issue type, at the *10%, **5% or ***1% level.

	N	Mean	Median	Standard Dev	Minimum	Maximum
Sukuk issuances						
Amount issued	164	26,700,000	7,406,357**	62,200,000	789,473.7	594,000,000
Issue price	94	97.697	98.984	9.559	6.802	100
Coupon	164	1.515***	0***	2.618	0	8.805
Maturity	164	2.172***	0.499***	3.705	0.068	22.014
Bond issuances						
Amount issued	645	28,100,000	11,500,000**	63,400,000	293,599.5	718,000,000
Issue price	274	98.443	99.118	6.443	26.316	100
Coupon	645	0.578***	0***	1.677	0	7.7
Maturity	645	0.83***	0.249***	1.959	0.077	17.55

Table 3
Descriptive statistics by issuer

The table sums up the issuer characteristics the year preceding the issue, depending on the security it issued. The sample encompasses 114 unique issuers, 47 issued *sukuk* and 67 issued bonds (no overlapping). Variables are in million USD with the exception of ratios in percentage and maturity in years. For these two last variables, each issue has been weighted by its amount. Data are spawning from 2001 to 2009 (one year before the issue). The stars indicate significant differences for means (ttest) and medians (Kruskall-Wallis test) of the variables by issue type, at the *10%, **5% or ***1% level.

	N	Mean	Median	Standard Dev	Minimum	Maximum
Bonds Issuers						
Sales	168	506.668	193.569***	636.715	3.573	3781.562
Market capitalization	165	0.66***	0.768***	0.249	0.067	0.94
Fixed Assets to Total Assets	166	0.385	0.407	0.257	0.004	0.918
Debt ratio	164	32.534	31.302	17.159	0.511	88.5
Current ratio	132	1.422**	1.237***	0.884	0.038	4.512
Altman Z-Score	132	1.528	1.705	3.25	-8.671	14.798
Ebitda to Total Assets (%)	136	7.837	7.461**	7.388	-13.727	52.556
Return on assets (%)	160	2.393**	1.601***	8.126	-16.898	55.323
FCF on assets	167	0.005***	0.003*	0.095	-0.268	0.582
Amount Issued per Year	174	142***	65.8***	208	0.310	1750
Mean Maturity per Year	174	2.69	0.634	3.429	0.067	17.55
Sukuk Issuers						
Sales	110	508.712	82.968***	1456.919	3.793	10281.84
Market capitalization	110	0.811***	0.844***	0.123	0.075	0.988
Fixed Assets to Total Assets	110	0.409	0.407	0.225	0.005	0.927
Debt ratio	108	33.561	32.878	16.738	0.2	98.092
Current ratio	108	1.754**	1.514***	1.255	0.108	8.432
Altman Z-Score	110	1.654	1.949	2.63	-7.28	11.681
Ebitda to Total Assets (%)	107	8.928	8.74**	4.97	-2.723	20.675
Return on assets (%)	107	4.35**	4.467***	4.981	-14.013	19.482
FCF on assets	109	-0.028***	-0.012*	0.107	-0.365	0.264
Amount Issued per Year	112	64.3***	26.2***	108	2.639296	797
Mean Maturity per Year	112	3.292	1.122	4.321	0.079	22.014

Table 4
Cumulative abnormal returns

The table presents the cumulative abnormal returns zero to five days surrounding the issue event. The sample has been divided between issues that occurred outside and during the financial crisis. The CARs are displayed in points of percentage. Ttest has been generated to test the significance of means. Aburthnott non-parametric sign-test for medians and Kruskall-Wallis non parametric test for differences of medians have been calculated. *, ** or *** indicate significance of the variables at the 10%, 5% or 1% confidence level.

Windows	Issue Type	N	CAR Mean	SCAR Mean	CAR Median
Full Sample					
[0,0]	*Sukuk*	164	-0.039	-0.01	-0.04
	Bond	645	0.24**	0.082*	0
	Difference	809	-0.28	-0.092	-0.038
[-1,1]	*Sukuk*	164	-0.552*	-0.078	-0.56**
	Bond	645	0.265	0.047	0
	Difference	809	-0.816**	-0.124	-0.563*
[-2,2]	*Sukuk*	164	-0.721*	-0.106	-0.55
	Bond	645	0.09	0.011	0
	Difference	809	-0.811	-0.118	-0.115
Outside the financial crisis					
[0,0]	*Sukuk*	132	-0.004	-0.017	-0.06
	Bond	412	0.268**	0.098*	0
	Difference	544	-0.272	-0.115	-0.06
[-1,1]	*Sukuk*	132	-0.39	-0.039	-0.65*
	Bond	412	0.33*	0.048	0
	Difference	544	-0.721*	-0.086	-0.649*
[-2,2]	*Sukuk*	132	-0.656	-0.105	-0.51
	Bond	412	0.214	0.02	0.01
	Difference	544	-0.869*	-0.125	-0.108
During the financial crisis					
[0,0]	*Sukuk*	32	-0.186	0.022	0
	Bond	233	0.191	0.055	0
	Difference	265	-0.377	-0.033	0
[-1,1]	*Sukuk*	32	-1.216	-0.239	-0.32
	Bond	233	0.149	0.045	-0.08
	Difference	265	-1.365	-0.284	-0.239
[-2,2]	*Sukuk*	32	-0.991	-0.111	-0.98
	Bond	233	-0.128	-0.003	-0.16
	Difference	265	-0.863	-0.108	-0.156

Table 5
Regression of cumulative abnormal returns

The table presents the estimations of OLS regressions of cumulative abnormal returns (CAR). Dummy variables for sector and year of issuance are also included but not reported. Standard deviations are clustered at the issuer level. The sample is divided between issues that occurred outside and during the financial crisis. Student's statistic is displayed in brackets. ***, **, and * denote coefficients that are statistically significant at the 1%, 5%, and 10% level.

	CAR[-1,1]			CAR[-2,2]		
	Full Sample	*Outside Crisis*	*During Crisis*	*Full Sample*	*Outside Crisis*	*During Crisis*
Sukuk	-0.55**	-0.36	-1.19	-0.68**	-0.50	-0.19
	(-2.35)	(-1.39)	(-1.44)	(-2.05)	(-1.15)	(-0.18)
Amount issued	-0.006*	-0.007*	-0.004	-0.006**	-0.004	-0.008**
	(-1.98)	(-1.95)	(-0.99)	(-2.18)	(-0.87)	(-2.32)
Coupon	-0.09	0.01	-0.43	-0.18	-0.10	-0.18
	(-0.98)	(0.12)	(-0.66)	(-1.66)	(-0.68)	(-0.32)
Maturity	0.04	0.01	0.13	0.12*	0.08	0.08
	(0.62)	(0.18)	(0.31)	(1.83)	(1.12)	(0.22)
Sales (log)	-0.04	0.17	-0.35	-0.03	0.02	-0.32
	(-0.32)	(1.44)	(-0.57)	(-0.22)	(0.13)	(-0.55)
Market capitalization	1.32	4.61**	-2.93	-1.02	0.60	1.31
	(0.49)	(2.25)	(-0.21)	(-0.37)	(0.21)	(0.09)
Debt ratio	-0.00	-0.01	0.01	0.01	0.01	-0.03
	(-0.23)	(-0.31)	(0.23)	(0.22)	(0.36)	(-0.64)
Current ratio	-0.04	-0.31	1.10	0.12	-0.06	0.74
	(-0.24)	(-1.60)	(0.85)	(0.59)	(-0.27)	(0.60)
Altman Z score	0.19***	0.23***	0.37**	0.23**	0.28*	0.18
	(3.68)	(3.03)	(2.21)	(2.03)	(1.93)	(1.04)
Constant	1.02	-2.02	2.46	4.20*	3.84	-1.01
	(0.42)	(-0.91)	(0.24)	(1.73)	(1.40)	(-0.10)
Sectors Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Years Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
N	697	490	207	697	490	207
Nb of Issuers (clusters)	65	61	22	65	61	22
R²	0.02	0.05	0.03	0.02	0.04	0.02

Table 6
Abnormal Operating Performance

The table presents the means and medians of cumulated (Cltd) abnormal operating performance proxied by three different performance indicators. The sample has been divided between issues that occurred outside and during the financial crisis. Two types of expectancy calculations are displayed. Wilcoxon non-parametric test has been used to test significance of medians. *, ** or *** indicate significance of the variables at the 10%, 5% or 1% confidence level.

	Full Sample			*Outside Crisis*			*Crisis*		
	N	Mean	Median	N	Mean	Median	N	Mean	Median
Ebitda									
Standard Expectancy									
N-1	96	0.725	0.025	71	1.215	1.467	25	-0.665	-1.429
Current	101	1.257*	0.981	76	1.387	0.967	25	0.859	1.013
Cltd N+1	100	1.685	2.913	76	1.753	2.65	24	1.468	3.026
Cltd N+2	93	1.849	1.227	69	1.331	0.192	24	3.338	3.745
Cltd N+3	87	0.872	1.461	63	-0.307	-3.737	24	3.969	2.784
Variation Expectancy									
Current	96	0.462	0.354	71	0.088	0.082	25	1.523*	2.185
Cltd N+1	95	-0.37	-0.004	71	-1.08	-1.05	24	1.731	1.304
Cltd N+2	88	-0.477	-0.855	64	-1.674*	-1.34	24	2.714*	3.487
Cltd N+3	84	-1.657*	-1.708	60	-2.91**	-2.753**	24	1.475	2.809
ROA									
Standard Expectancy									
N-1	98	1.672*	1.868**	75	1.69	2.421**	23	1.614*	1.22
Current	101	0.859	1.22***	76	0.485	1.129*	25	1.997*	2.354
Cltd N+1	99	2.957*	4.141***	75	2.44	3.168**	24	4.571**	4.611*
Cltd N+2	89	4.756**	6.646***	65	3.865	5.955**	24	7.169**	8.519*
Cltd N+3	84	5.627*	8.753**	60	4.585	8.564*	24	8.23*	11.244
Variation Expectancy									
Current	98	-1.002	-0.244	75	-1.39	-0.506	23	0.26	0.399
Cltd N+1	96	0.145	0.095	74	-0.038	-0.426	22	0.759	1.868
Cltd N+2	86	-1.549*	-0.551	64	-2.341**	-2.289**	22	0.756	2.315
Cltd N+3	81	-1.447	0.242	59	-1.643	-0.312	22	-0.922	0.873
FCF									
Standard Expectancy									
N-1	100	-0.017	-0.007	75	-0.024	-0.007	25	0.003	0.003
Current	105	-0.02*	-0.002	80	-0.024*	-0.005	25	-0.005	-0.002
Cltd N+1	105	-0.028	0.004	80	-0.036	0.005	25	-0.005	-0.019
Cltd N+2	96	-0.015	0.032	72	-0.028	0.021	24	0.026	0.051
Cltd N+3	93	-0.015	0.043*	69	-0.045	0.034	24	0.07*	0.061*
Variation Expectancy									
Current	100	-0.007	-0.022	75	-0.006	-0.007	25	-0.008	-0.036
Cltd N+1	100	0.008	0.018	75	0.012	0.021	25	-0.004	0.004
Cltd N+2	91	0.025*	0.02	67	0.029*	0.022	24	0.016	0.011
Cltd N+3	90	0.021	0.027	66	0.015	0.013	24	0.037	0.036

Table 7
Regression of performance indicators

The table presents the estimations of panel regressions with random effects on Ebitda and RoA forwarded from one to three years after the issuance and on the variation from the year of the issuance to the third year. The set of control variables includes *Sales (log)*, *Market capitalization, Leverage, Current ratio, Altman Z score, Total Amount Issued, and Mean Maturity*. Dummy variables for sector and year of issuance are also included. Standard deviations are clustered at the issuer level. Student's statistic is displayed in brackets and Chi² for the difference in square brackets. ***, **, and * denote coefficients that are statistically significant at the 1%, 5%, and 10% level.

	Ebitda				RoA			
	N+1	N+2	N+3	*Variation*	N+1	N+2	N+3	*Variation*
Full Sample								
Sukuk	2.01	1.62	0.21	-0.99	-0.16	-1.27	-2.52**	-1.19
	(0.93)	(0.78)	(0.08)	(-0.53)	(-0.18)	(-1.54)	(-2.07)	(-0.82)
Bond	2.75	2.14	1.66	0.87	-0.48	-0.32	-1.01	-0.65
	(1.62)	(1.46)	(1.03)	(0.74)	(-0.63)	(-0.40)	(-1.37)	(-0.73)
Constant	6.37	5.71	1.99	-0.38	-8.45*	-8.42*	-7.49	0.16
	(0.51)	(0.43)	(0.15)	(-0.23)	(-1.79)	(-1.72)	(-1.44)	(0.18)
Sukuk-Bond	-0.73	-0.52	-1.45	-1.86	0.32	-0.96	-1.51	-0.53
	[0.26]	[0.09]	[0.49]	[1.09]	[0.16]	[1.22]	[1.68]	[0.13]
N	1166	1094	1021	928	1143	1074	1001	902
Overall R²	0.37	0.38	0.40	0.41	0.36	0.36	0.37	0.22
Chi²	50.74	51.59	65.87	46.24	449.18	421.24	348.96	787.41
Outside the financial crisis								
Sukuk	0.07	-1.05	1.26	-0.14	0.01	-1.67	-2.94**	-1.04
	(0.06)	(-0.86)	(0.38)	(-0.06)	(0.01)	(-1.59)	(-2.03)	(-0.54)
Bond	0.53	0.91	1.44	1.25	-0.88	-0.41	-1.24	-0.64
	(0.66)	(1.10)	(0.91)	(0.89)	(-1.12)	(-0.53)	(-1.56)	(-0.55)
Constant	-4.03	-4.51	16.01	2.71	-7.15	-8.20	-7.56	0.60
	(-0.71)	(-0.78)	(0.89)	(0.97)	(-1.49)	(-1.53)	(-1.33)	(0.39)
Sukuk-Bond	-0.46	-1.96*	-0.18	-1.39	0.89	-1.27	-1.70	-0.40
	[0.27]	[3.11]	[0.00]	[0.34]	[0.75]	[1.86]	[1.55]	[0.04]
N	995	929	865	776	974	911	846	749
Overall R²	0.39	0.39	0.43	0.44	0.34	0.34	0.34	0.22
Chi²	188.47	178.06	59.60	36.66	267.59	284.48	306.57	966.81
During the financial crisis								
Sukuk	0.44	1.92	-1.91	-2.10	-0.73	0.28	-0.78	-1.04
	(0.10)	(0.84)	(-0.98)	(-0.99)	(-0.45)	(0.24)	(-0.50)	(-0.54)
Bond	-3.46	-2.61	0.93	-0.92	0.94	0.00	-1.26	-1.07
	(-1.06)	(-0.64)	(0.49)	(-0.60)	(0.82)	(0.00)	(-0.77)	(-0.63)
Constant	-36.26	-56.11	-6.80	-3.43	-18.37**	-5.79	-8.47	5.91*
	(-1.53)	(-1.34)	(-1.19)	(-0.97)	(-2.13)	(-1.55)	(-1.52)	(1.88)
Sukuk-Bond	3.89	4.53	-2.85	-1.18	-1.66	0.28	0.48	0.03
	[0.49]	[0.65]	[1.46]	[0.31]	[0.69]	[0.02]	[0.06]	[0.00]
N	171	165	156	152	169	163	155	153
Overall R²	0.84	0.78	0.71	0.20	0.58	0.69	0.67	0.29
Chi²	456	31.19	218.45	199.11	4016.06	1486.24	185.72	101.89

Table 8
Regression of free cash-flows indicator

The table presents the estimations of panel regressions with random effects on free cash-flows forwaded from one to three years after the issuance and on the variation from the third year to the year of the issuance. The set of control variables includes *Sales (log)*, *Market capitalization, Leverage, Current ratio, Altman Z score, Amount Issued* and *Maturity*. Dummy variables for sector and year of issuance are also included. Standard deviations are clustered at the issuer level. Student's statistic is displayed in brackets and Chi² for the difference in square brackets. ***, **, and * denote coefficients that are statistically significant at the 1%, 5%, and 10% level.

	FCF			
	N+1	N+2	N+3	*Variation*
Full Sample				
Sukuk	0.003	0.03***	0.03***	0.05***
	(0.33)	(2.95)	(3.28)	(3.44)
Bond	0.01	0.01	0.01	0.01
	(1.21)	(1.00)	(0.88)	(0.87)
Constant	0.06*	0.06*	0.05	-0.01
	(1.74)	(1.79)	(1.42)	(-0.56)
Sukuk-Bond	-0.01	0.02*	0.02*	0.04**
	[0.54]	[3.09]	[3.56]	[5.40]
N	1168	1097	1024	932
Overall R²	0.33	0.34	0.34	0.11
Outside the financial crisis				
Sukuk	0.002	0.02**	0.03**	0.06***
	(0.14)	(2.29)	(2.13)	(3.31)
Bond	0.01	0.01	0.01	0.02*
	(0.90)	(0.82)	(1.02)	(1.84)
Constant	0.02	0.03	0.09**	0.01
	(0.46)	(0.77)	(2.14)	(0.67)
Sukuk-Bond	-0.01	0.02	0.02	0.04**
	[0.30]	[2.17]	[1.55]	[4.45]
N	996	932	868	778
Overall R²	0.31	0.32	0.35	0.13
During the financial crisis				
Sukuk	-0.03	0.01	0.02	-0.01
	(-1.13)	(0.53)	(0.78)	(-0.19)
Bond	-0.02	-0.00	-0.01	-0.03
	(-1.09)	(-0.07)	(-0.50)	(-1.03)
Constant	-0.05	-0.02	-0.03	0.01
	(-0.88)	(-0.32)	(-0.46)	(0.26)
Sukuk-Bond	-0.01	0.01	0.03	0.02
	[0.23]	[0.24]	[0.96]	[0.37]
N	172	165	156	154
Overall R²	0.56	0.63	0.39	0.15

Table 9
Buy and Hold Abnormal Returns

The table presents the buy and hold abnormal returns one to three years after the issuance event. The sample has been divided between issues that occurred outside and during the financial crisis. The BHARs are displayed in points of percentage. Ttest has been generated to test the significance of means. Aburthnott non-parametric sign-test for medians and Kruskall-Wallis non parametric test for differences of medians have been calculated. *, ** or *** indicate significance of the variables at the 10%, 5% or 1% confidence level.

Years	Issue Type	N	Mean BHAR	Median BHAR
Full Sample				
1	*Sukuk*	164	-0.19	-11.48***
	Bond	645	13.6***	10.14***
	Difference	809	-13.79***	-21.62***
2	*Sukuk*	164	-14.1***	-22.67***
	Bond	645	34.04***	21.86***
	Difference	809	-48.13***	-44.53***
3	*Sukuk*	164	-20.11***	-35.02***
	Bond	645	66.86***	42.29***
	Difference	809	-86.97***	-77.31***
Outside the financial crisis				
1	*Sukuk*	132	-1.09	-13.34***
	Bond	412	6.59***	3.45
	Difference	544	-7.68	-16.79***
2	*Sukuk*	132	-17.4***	-26.97***
	Bond	412	19.32***	17.3***
	Difference	544	-36.72***	-44.27***
3	*Sukuk*	132	-27.93***	-39.39***
	Bond	412	57.13***	38.33***
	Difference	544	-85.07***	-77.71***
During the financial crisis				
1	*Sukuk*	32	3.52	-3.62
	Bond	233	26***	21.51***
	Difference	265	-22.47**	-25.13***
2	*Sukuk*	32	-0.47	-9.66
	Bond	233	60.06***	51.98***
	Difference	265	-60.53***	-61.65***
3	*Sukuk*	32	12.18	5.64
	Bond	233	84.07***	58.37***
	Difference	265	-71.89***	-52.73***

Table 10
Regression of buy and hold abnormal returns

The table presents the estimations of OLS regressions of BHARs. We only report the key independent variable *Sukuk* in the table. The set of control variables includes *Sales (log)*, *Market capitalization, Leverage, Current ratio, Altman Z score, Amount Issued, Coupon* and *Maturity* . Dummy variables for sector and year of issuance are also included. Standard deviations are clustered at the issuer level. The sample is divided between issues that occurred outside or during the financial crisis. Student's statistic is displayed in brackets. ***, **, and * denote coefficients that are statistically significant at the 1%, 5%, and 10% level.

	BHAR		
Years	1	2	3
Full Sample			
Sukuk	-11.15	-39.87***	-72.82***
	(-1.53)	(-3.71)	(-3.75)
Constant	-124.51	-95.72	-283.93**
	(-1.66)	(-1.46)	(-2.09)
Firm Variables	*Yes*	*Yes*	*Yes*
Issuance Variables	*Yes*	*Yes*	*Yes*
Sectors Fixed Effects	*Yes*	*Yes*	*Yes*
Years Fixed Effects	*Yes*	*Yes*	*Yes*
N	700	690	678
Nb of Issuers (clusters)	65	63	63
R²	0.30	0.52	0.63

	BHAR			BHAR		
Years	1	2	3	1	2	3
	Outside Financial Crisis			*During Financial Crisis*		
Sukuk	-6.74	-36.44***	-75.22***	-9.91	29.16	74.16
	(-0.83)	(-3.27)	(-4.00)	(-0.53)	(0.56)	(0.68)
Constant	-138.20	-154.78**	-298.25***	-62.62	262.53	289.92
	(-1.45)	(-2.50)	(-2.96)	(-0.75)	(1.44)	(1.13)
Firm variables	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Issuance Variables	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Sectors Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Years Fixed Effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
N	487	478	466	213	212	212
Nb of Issuers (clusters)	61	60	60	22	21	21
R²	0.25	0.40	0.58	0.53	0.77	0.82