ECONOMIC RESEARCH FORUM
منتدى البحوث الاقتصادية
Working Paper Series

SUKUK MARKET DEVELOPMENT AND ISLAMIC BANKS' CAPITAL RATIOS

Houcem Smaoui and Hatem Ghouma

Working Paper No. 1329

SUKUK MARKET DEVELOPMENT AND ISLAMIC BANKS' CAPITAL RATIOS

Houcem Smaoui[1] and Hatem Ghouma[2]

Working Paper No. 1329

August 2019

Send correspondence to:
Houcem Smaoui
Qatar University
hsmaoui@qu.edu.qa

[1] College of Business and Economics, Qatar University, Doha, 2713 Qatar. Phone: (+974) 4403-6750. Fax: (+974) 44035081.

[2] Gerald Schwartz School of Business, St. Francis Xavier University, 3090 Martha Drive, Room 379. Antigonish, NS B2G 2W5 Nova Scotia, Canada. Phone: +1 (902) 867-5450.Fax: +1 (902) 867-5385. Email: hghouma@stfx.ca

First published in 2019 by
The Economic Research Forum (ERF)
21 Al-Sad Al-Aaly Street
Dokki, Giza
Egypt
www.erf.org.eg

Abstract

This paper investigates the impact of Sukuk market development on Islamic banks' capital ratios using a sample comprising 230 Islamic banks spanning the period 2005-2014. We characterize Islamic bank capital along multiple dimensions, namely: capital adequacy ratio, Tier 1 capital ratio, and capital-to-total assets ratio. We employ both the Prais-Winston technique and the system GMM estimator to tackle potential omitted variable bias, endogeneity, and simultaneity issues. The evidence shows that Sukuk market development has had a negative effect on capital ratios of Islamic banks. We argue that the development of Sukuk markets may have stimulated the competition between Islamic Banks, inducing them to hold lower capital ratios. Our results also show that trade openness and bank liquidity are positively and significantly related to capital ratios, while bank size and loan loss reserve ratio are negatively and significantly related to capital ratios, as expected.

Keywords: Sukuk; Islamic Banking; Capital Ratios; GMM estimation.

JEL Classifications: C33; G1; G15; G28.

1. Introduction

To be considered Islamic, financial transactions have to comply with Sharia, which is a set of religious and moral laws (Islamic law). Sharia forbids interest, making money from money (*Ribah*), uncertainty-based transactions (*Gharar*), gambling and speculation (*Maysir*), and prohibited industries such as tobacco, alcohol, adult entertainment, etc. (Beck et al., 2013). Islamic financial system, just like the conventional one, features banks (called Islamic Banks), other financial institutions such as insurance companies (called *Takaful* companies), capital markets, and financial instruments. All these should operate within the Sharia law.

Prior studies on Islamic finance mainly investigated two research venues: Sukuk markets (Islamic debt markets) and Islamic banks (IBs, hereafter). Sukuk, generally referred to as Islamic bonds, are "*certificates of equal value representing undivided shares in ownership of tangible assets, usufruct and services or (in the ownership of) the assets of particular projects or special investment activity*."[3]They must be structured in a way to generate returns to investors (similar to those received by conventional bondholders) without infringing the precepts of Islamic law.

Previous studies on Sukuk have analyzed their structures, their risks, and their role in the mobilization of resources for Sharia-compliant firms (see Tariq and Dar (2007), for instance). More recent studies investigate the signalling effect of Sukuk market by analyzing the reaction of stock markets following Sukuk issuance announcements. For instance, Alam et al. (2013) document a stock market negative reaction to Sukuk issuance announcement before and during the recent global financial crisis.

[3] Accounting and Auditing Organization For Islamic Financial Institutions (AAOIFI), standard No. 17 on investment Sukuk.

Godlewski et al. (2013) also reports the same results for the Malaysian market. In relation to conventional bond markets, Hassan et al. (2017) document a co-integration between bonds and Sukuk markets, suggesting an increased cross-market co-movement. The authors conclude that Sukuk instruments seem to provide valuable portfolio diversification benefits due to their lower volatility and dynamic correlation paths. In the same vein, Haque et al., (2017) analyze the lag-lead relationship between Sukuk and bond markets. Their findings also support a causal relationship between Sukuk and bonds. They also find that, in the long-term, Sukuk markets generally lead bonds markets.

Analyzing the particularity of the Islamic banking system was probably the other topic in Islamic finance that has attracted wide attention from researchers. Many studies have focused on comparing the performance of conventional and Islamic banks (e.g., Beck et al., 2013; Johnes et al. 2014; Mollah and Zaman 2015; Bitar et al., 2017). The results generally support the idea that IBs (especially during the recent financial crisis of 2008) enjoy higher asset quality (Beck et al., 2013), stronger capitalization (Beck et al., 2013; Bitar et al., 2017), better performance (Beck et al., 2013, Mollah and Zaman, 2015), more solid efficiency (Johnes et al., 2014), and higher resilience (Cihak and Hesse, 2010) than conventional banks (CBs, hereafter). This strand of literature on IBs has also investigated the impact of Sharia constraints on IBs' risk-taking behaviour. Some studies argue that the profit and loss sharing (PLS, hereafter) feature of Islamic banking adds more complexity to the risk management of the bank, resulting in higher levels of risk (Hasan and Dridi, 2011; Ahmed and Khan, 2007; Siddiqui, 2008). Others argue that, due to the absence of sophisticated Sharia-compliant hedging instruments, IBs tend to rely on markup financing which makes their risk-sharing transactions very limited (Chong and Liu, 2009; Abdul-Rahman et al., 2014). This suggests that IBs are taking less risk than CBs. Cihak and Hesse (2010) empirically investigate this question and find that IBs are more stable (higher z-scores) than CBs. Their studies has stimulated many other researchers who analyzed the same topic but in

different frameworks and using different measures of risk (Boumediene, 2011; Gamaginta and Rokhim, 2011; Pappas et al., 2012; Abedifar et al., 2013; Beck et al., 2013; Kabir et al., 2015). The results are not conclusive as some studies conclude that IBs are less risky while others find small or no evidence of differences.

This risk dimension has been the entry gate to assess the resilience of IBs. Other Islamic banking dimensions that could affect banks' resilience to shocks have not attracted much attention in the literature. For instance, unlike the abundance of literature on the concept of capitalization in CBs, one can easily notice the absence of studies that analyze this crucial concept for IBs. Bank capitalization is the core of any banking regulation as banks' capital represents the first line of defence in case of financial shocks. The only evidence we know so far from prior studies is that IBs are better capitalized than CBs (Turk-Ariss, 2010; Beck et al., 2013; Bitar et al., 2017). This is despite the increasing number of countries where Islamic Finance is present. Indeed, according to the 2017 Islamic Financial Services Board (IFSB)[4], there are at least 35 countries where Islamic finance exists. Besides Sudan and Iran (where Islamic Finance has 100% market shares), countries like Brunei, Saudi Arabia, UAE, Kuwait, Malaysia, Qatar, Yemen, Djibouti, Jordan, and Bangladesh, have more than 15% share of Islamic banking assets as a proportion of their total domestic banking sector assets.[5] This percentage is between 5 to 15% for countries like Turkey, Indonesia, Egypt, Oman, Bahrain, Tunisia, Pakistan, Palestine, Afghanistan, and the Maldives. Other countries like the United Kingdom, Singapore,

[4] The Islamic Financial Services Board (IFSB) is an international standard-setting organization established on 3 November 2002. Its membership base covers more than 180 members including 75 regulatory and supervisory financial authorities (mainly central banks) and international multilateral organizations (such as the World Bank, the Islamic Development Bank, the International Monetary Fund, the Bank for International Settlements, the Asian Development Bank, etc.). The IFSB has the mandate to promote the soundness and stability of the Islamic financial services industry by issuing guiding principles and prudential standards in the same way as the Bank of International Settlements.

[5] This percentage does not include other Islamic Finance assets such as Sukuk, Islamic Insurance, and Islamic Asset Management.

Thailand, Nigeria, and South Africa have recently witnessed growth in Islamic Finance assets, but still have an insignificant share in the total domestic banking sector assets.

Thus, despite the rapid growth of Islamic banking industry, little is known about the functioning of this system. For instance, the nature of the relationship that might link IBs capital ratios to Sukuk markets has not been explored yet. This research attempts to fill this gap in the literature by investigating to what extent the development of Sukuk markets impacts on the IBs' capitalization ratios. The choice of Sukuk market as a potential determinant of banks' capitalization ratios is not arbitrary given the recent remarkable development of these markets. In 2012, an article in Wall Street Journal states that Sukuk outpaced conventional bonds to represent more than half of new issuance in the Gulf region.[6]

This research explores two competing hypotheses. The first one conjectures that Sukuk market development has a positive effect on IBs' capital ratios. Many reasons can support this conjecture. First, the presence of a well-functioning Sukuk market provides IBs with an opportunity to invest in high-quality Sukuk, thereby lowering their risk-weighted assets (the denominator of the capital adequacy ratio) and increasing their capital ratios. Second, IBs can benefit from the Sukuk market development and issue Sukuk that are considered as Tier 1 or Tier 2 additional capital, hence improving their capital ratios.

At the opposite, the second hypothesis suggests that the development of Sukuk market has an adverse effect on IBs' capitalization ratios. If more developed Sukuk market tightens competition between IBs, these latter might pursue aggressive lending strategies resulting in higher portfolio risks (so higher risk-weighted assets), i.e. lower banks' capitalization ratios. Moreover, and as suggested by prior

[6] "Sukuk—A Growing Success Story" By Catherine Bolgar, The Wall Street Journal, 5 November 2013.

studies (for instance Hellman et al., 2000; Allen and Gale, 2004), competition might incentivize IBs to reduce their capital at risk to the minimum requirement. In fact, the increased risk due to competition might encourage IBs to shift that risk to depositors and creditors. In such circumstance, they would probably retain fewer earnings and issue less common equity (while financing their risky portfolios using deposits and other non-equity sources of financing). Over time, this would ultimately lead to lower capital ratios.

Using data on Islamic banks and Sukuk markets from 13 countries and spanning the period 2005-2014, we report a strong evidence that Sukuk market development has had a negative effect on IBs' capitalization ratios. This result is robust to alternative specifications and after addressing potential endogeneity issues. We argue that the development of Sukuk markets may have stimulated the competition between IBs, inducing them to hold lower capital ratios and to increase the riskiness of their portfolios of assets. Our results also show that openness and liquidity ratio are positively related to capital adequacy ratios, while bank size and loan loss reserve ratio are negatively related to capital adequacy ratios, as expected.

This research contributes to the existing literature in two ways. First, it adds to the growing literature on the determinants of IBs' behaviour. Contrary to prior studies that merely compare capital ratios between Islamic and conventional banks, we shed light on an important exogenous factor, namely Sukuk market that might affect IBs' capitalization ratio. This factor has been largely ignored so far. What makes this factor unique is that IBs do not have much control over it. Our study provides evidence that this factor is, to some extent, a source of systematic risk that has altered the behaviour of IBs.

Second, we extend the existing literature on financial development by including a new market: Islamic bond markets (Sukuk). Prior studies mainly focused on the impact of banks, bond markets, and equity

markets on economic growth. Our findings suggest that the efforts of regulators towards fostering economic growth using financial development might alter the behaviour of some key players in the economy. Indeed, our results show that working towards developing Sukuk markets, which ultimately aims to boost the economic growth, might result in banks becoming less capitalized which could jeopardize the financial stability of the whole system. Regulators and decision makers might find in these findings a guidance on what other factors should they consider when they act towards developing the Islamic financial markets.

The rest of the paper proceeds as follows. Section 2 presents an overview of the Sukuk markets. In section 3, we review the literature and develop our hypothesis. In sections 4 and 5, we describe the data, the variables, and the methodology. Section 6 presents our findings, while section 7 concludes.

2. Overview of Sukuk Markets

Sukuk market has grown rapidly in the recent years. Lower oil prices are the main driver for sovereign Sukuk issuance in the Gulf region due to the increased budget deficit. According to the Islamic Financial Services Board[7] (IFSB) report (2017), global Islamic banking assets reached USD 1.5 Trillion in 2016. The market share of Sukuk is estimated at 17%. The IFSB data also shows that new Sukuk issuances have experienced a 16.3% increase in volume to USD 74.8 billion in 2016. Malaysia is the largest Sukuk outstanding market in 2016, accounting for a 46.4% share of the total market. Saudi Arabia, the UAE, and Qatar have market shares of 17.4%, 10.5%, and 5.9% respectively. There are eight countries not members of the Organization of the Islamic Cooperation (OIC) that currently

[7] The Islamic Financial Services Board (IFSB) is an international standard-setting organization established on 3 November 2002. Its membership base covers more than 180 members including 75 regulatory and supervisory financial authorities (mainly central banks) and international multilateral organizations (such as the World Bank, the Islamic Development Bank, the International Monetary Fund, the Bank for International Settlements, the Asian Development Bank, etc.). The IFSB has the mandate to promote the soundness and stability of the Islamic financial services industry by issuing guiding principles and prudential standards in the same way as the Bank of International Settlements.

have outstanding Sukuk. These countries are France, Germany, Luxembourg, the United Kingdom, Singapore, Hong Kong, South Africa, and the United States.

Sukuk are financial securities structured in a way to generate returns to their holders (called Sukuk holders) without infringing on Islamic law. Although they are commonly known as "Islamic Bonds", Sukuk can more accurately be described as "Islamic investment trust certificates". Contrary to conventional bonds, which represent a debt title, Sukuk evidence an ownership interest. According to the definition provided by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), Sukuk represent undivided stakes in the ownership of assets. Standards number 7 of the AAOIFI specifies 14 categories of permissible Sukuk structures. We present below brief definitions of the most used Sukuk structures:

Sukuk al-Ijara (Lease)

These Sukuk represent ownership in a rented asset or the usufruct of an asset. Since Sukuk holders are the true owners of the underlying assets, they should bear all costs of maintenance and damage to the assets. This structure has become the most commonly used due to the investors' familiarity with the structure and the possibility of being traded in the secondary market.

Sukuk al-Wakala

A Wakala (agency) is an Islamic contract whereby an agent is given the power to act on behalf of another person. This structure is very useful when the issuer sells a portfolio of assets to Sukuk holders and acts as an agent to operate the portfolio on their behalf. The Sukuk holders will periodically receive the income generated by the portfolio and the agent might receive a remuneration for his role. At the maturity of the Sukuk, the originator (who is the original owner of the assets) would buy back the portfolio of assets.

Sukuk al-Mudaraba (joint-venture)

The Mudaraba is a contract whereby an entrepreneur contributes the efforts while a financier contributes money to jointly undertake a project. This Sukuk structure is suitable if the firm does not own an actual asset but has a solid expertise. The Sukuk holders would finance this venture and both parties would agree on the profit distributions. This structure is extensively used by banks to issue Tier 1 or Tier 2 capital Sukuk.

Sukuk al-Musharaka (partnership)

The Musharaka structure is very close to the Mudaraba with the only difference is that both parties contribute capital to the partnership. Profits and losses are generally proportionate to each party's contribution. Similar to Mudaraba Sukuk, this structure can be used by banks to issue Tier 1 or Tier 2 capital Sukuk.

Murabaha Sukuk (cost-plus transaction)

In its simplest structure, the originator of this type of Sukuk would buy an asset or commodity from the seller (the Sukuk holders). The buyer will immediately own the underlying asset but pays the purchase price (which consists of the original cost of the asset/commodity plus a markup) in instalments over a certain period. This structure is very simple to implement, however, it is not permissible to trade it in the secondary market.

3. Literature Review and Hypotheses Development

In spite of the similarity with respect to their role as financial intermediaries, IBs differ from CBs in many aspects. IBs are constrained by their Sharia board to provide Sharia-compliant products. As such, they are prohibited from financing (or investing in) illicit activities and from charging or receiving *Riba* payments (interest) (Beck et al., 2013). In addition, IBs are not allowed to engage in

any speculation activity (*Gharar*) or holding any toxic assets. Rather, they are encouraged to engage in risk-sharing activities whereby all deals and operations are to be backed by real economic transactions involving tangible assets. This structural discrepancy between the two business models would suggest clear differences in the way IBs and CBs fund their activities and invest their resources. To make sure that IBs operate according to the Islamic principles, each bank must have a Sharia board composed of experts who can provide a verdict on whether a transaction is Sharia-compliant or not.

A large body of studies on Islamic finance has examined IBs and compared their unique features to conventional banking institutions. Beck et al., (2013) compare CBs and IBs and report evidence of higher asset quality, better capitalization and stock performance, but also lower cost-efficiency of IBs. They also document large cross-country variations between CBs and IBs and large variations across IBs of different sizes. In the same vein, Johnes et al. (2014) find a difference between the efficiency of IBs and CBs, which they attribute to the lack of product standardization and the better managerial capability of IBs.

Bitar et al. (2017) use a principal component analysis to analyze the financial characteristics that distinguish between CBs and IBs. Their findings support the idea that IBs are more capitalized, more liquid and more profitable than CBs. Nevertheless, they show that IBs exhibit more volatile earnings, which is likely to be attributable to their higher capital.

The difference in the risk-taking attitudes between IBs and CBs has also caught the attention of many researchers. Islamic financial products naturally impose additional risk considerations on IBs (Errico and Sundararajan, 2002; Kabir and Worthington, 2014). Theoretically, the PLS feature is expected to add more complexity to the risk management of IBs (Hasan and Dridi, 2010; Ahmed and Khan, 2007; Siddiqui, 2008). However, many empirical studies argue that, due to the absence of sophisticated Sharia-compliant hedging instruments, IBs are mostly relying on markup financing making their risk-

sharing transactions very limited (Chong and Liu, 2009; Abdul-Rahman et al., 2014). In a related research, Cihak and Hesse (2010) try to address this issue empirically. Using the z-score as a measure of riskiness, they find that, on average, IBs are more stable (higher z-scores) than CBs. Since then, several studies have analyzed the same topic but in different frameworks and using different measures of risk (Boumediene, 2011; Gamaginta and Rokhim, 2011; Pappas et al., 2012; Abedifar et al., 2013; Beck et al., 2013; Kabir et al., 2015). Their results are not conclusive as some of this literature concludes that IBs are less risky while others find no evidence of differences.

There is no doubt that bank risk-taking attitude plays an important role in assessing the resilience of banks to financial shocks. Nevertheless, to the best of the authors' knowledge, there has not yet been any study that went beyond the concept of risk-taking to explore other determinants of IBs' resilience, such as the IB's capitalization ratios, as compared to the cornucopia of studies on the capitalization of CBs. What factors might affect IBs' capitalization ratios remains a key question, but unfortunately unanswered. This paper aims to fill this gap in the literature by investigating how Sukuk markets can affect the capitalization of IBs in a given country. The choice of the Sukuk market as a potential factor affecting IBs' capitalization choices is mainly motivated by the recent rapid growth of Sukuk markets. Jobst et al. (2008) argue that, despite the recent financial crisis, demand for Sharia-compliant securities, such as Sukuk, from both Islamic and conventional financial institutions, remains very strong. Ahmad and Radzi (2011) explore the impact of the economic conditions (in Malaysia) on the issuance of Sukuk and conventional bonds. They find that the GDP, the exchange rate, as well as the market liquidity are prominent determinants of Sukuk issuance in Malaysia. Surprisingly, the exchange rate is the only factor that affects conventional bonds issuance.

Other studies investigate market reactions to Sukuk issuances (Ashhari et al. 2009; Alam et al., 2013). Hassan et al. (2017) study the long-run relationship and dynamic correlations between major fixed-

income markets and Sukuk market. Their overall findings point to a co-integration effect between bonds and Sukuk markets, suggesting an increased cross-market co-movement. The authors conclude that, despite the noticeable similarities between Sukuk and conventional bonds, Sukuk instruments seem to provide portfolio managers with valuable diversification benefits due to their lower volatility and dynamic correlation paths. Haque et al., (2017) analyze the lag-lead relationship between Sukuk and bond markets and find a causal relationship between them. They also find that bond markets are generally led by Sukuk markets in the long run.

Relating to stock market reactions, Godlewski et al. (2013) document a negative market reaction of Malaysian stock market following Sukuk issuance. In 2016, Godlewski et al. investigate how Sukuk type and Sharia scholar reputation affect stock markets. They show that *Ijara Sukuk* structures, as well as Sharia scholar reputation and proximity to the issuer, exert a positive influence on the stock price of the issuing firm. Alam et al. (2013) document a stock market negative reaction to Sukuk issuance announcement before and during the recent global financial crisis. Bond issuance announcements, however, seem to have a positive impact on stock markets before the crisis, but a negative impact after and during the crisis.

In a recent research closer to ours, Smaoui and Nechi (2017) analyze the impact of Sukuk market development on economic growth. They report evidence that Sukuk market development is contributing to economic growth. Their findings also suggest that Sukuk market development might have promoted financial inclusion, which, in turn, might have had a positive effect on economic growth. Smaoui et al. (2017) is another research that explores the nature of the relationship between bank financing and Sukuk. The study shows that economies with more concentrated banking display less Sukuk market development, suggesting that Sukuk and bank financing are substitutes rather than complements.

Nevertheless, in these handful studies, the authors adopted a macroeconomic approach while leaving the impact of Sukuk market development on bank-specific variables an unexplored area of research. Based on the existing literature, two competing hypotheses are advanced. In the first hypothesis, we posit that Sukuk market development positively influences IB's capitalization ratio. However, in an alternative hypothesis, we conjecture that the level of development of the Sukuk market has a negative impact on IBs' capital ratios.

Why might Sukuk market development positively affect IB's capitalization ratio?

Sukuk markets may play a positive role in helping banks to strengthen their capital adequacy ratios and better manage their operations. This can be achieved in two ways. First, IBs have the opportunity to invest in high-quality Sukuk (low risk-weighted Sukuk investments) which reduces their risk-weighted assets, the denominator of the capital adequacy ratio. For instance, investing in government-issued Sukuk (which are usually zero risk-weighted) would result in lower risk-weighted assets, and, thus, higher capital adequacy ratio (CAR, hereafter). A well-developed Sukuk market would then provide IBs with a variety of Sukuk issuances, with different credit qualities, that they can use to improve their CAR via reducing their risk-weighted assets. If no (or weak) Sukuk markets are available, IBs would not have the chance to do so.

The second way to strengthen the CAR is by increasing its numerator by adhering to a solid funding structure. Deep, active, and liquid Sukuk markets provide financial institutions, including IBs, with valuable long-term financing opportunities (Levine, 2005). The presence of a developed Sukuk market would help IBs to finance their operations at a much lower cost and in a timely manner. On the contrary, the absence of such alternative means fewer financing options are available, which might imply a higher risk for the banks. For instance, Chiu et al. (2017) argue that debt financing strongly influences firms' default risk. Their findings suggest that firms that heavily rely on debt markets

financing (rather than bank financing) do not experience significant increases in default risk. This explains, to a certain extent, why rating agencies do pay increased attention to the funding structure (the source of funding and its quality) when they issue their ratings.

Moreover, and in a more direct way, IB's capitalization can be boosted by issuing Sukuk that are considered as Tier 1 or Tier 2 capital. From the signalling and the pecking order theories' standpoint, this Sukuk alternative (to the extent they are assimilated to debt securities) is even more attractive and less costly than issuing common equity (which suffers from underpricing and negative signalling). Under the Basel Accord, a bank's capital consists of two sources: Tier 1 capital, which is the bank's core capital, such as equity capital including perpetual debts and disclosed reserves, and Tier 2 capital, which is the bank's supplementary capital, such as unsecured subordinated debt with an original maturity not less than five years. To qualify for Tier 1 or Tier 2 capital, Sukuk must abide by certain features required by Basel Accord. The IFSB (2013) report suggests that financial instruments, other than the traditional common equity, can be considered additional Tier 1 or Tier 2 capital. Particularly, additional Tier 1 capital might include Sukuk if these latter fulfil the requirements of i) high degree of loss absorbency (i.e. ability to absorb losses), ii) undefined maturity (i.e. perpetual), though callability of the instrument is possible under certain conditions, iii) non-distribution of profits would not constitute or trigger a default event, and iv) insecurity, which means that the Sukuk can neither be secured nor guaranteed by the issuer. Moreover, the IFSB (2013) report acknowledges the possibility of Sukuk to be considered as Tier 2 capital if the issuance has the loss absorbency feature, where the underlying assets could be converted into shares of common equity at the maturity of the Sukuk or in case of insolvency, has a minimum maturity of 5 years, distributes profits that are not linked to the credit rating of the bank, and has no security nor a guarantee from the issuing bank. The reports namely

mentions Sukuk *Al-Musharaka*, *Al-Mudharaba*, and *Al-Wakala* as they can be the best candidates to satisfy the above-mentioned requirements.

In practice, many Islamic banks have issued Sukuk considered as additional Tier 1 capital or Tier 2. For instance, Dubai Islamic Bank, Abu Dhabi Islamic Bank, Qatar Islamic Bank, Boubyan Bank, and Noor bank have already issued perpetual Sukuk eligible for Tier 1 capital. Further, Asya Bank and Kuveyt Turk have also issued Tier 2 Sukuk. These samples of Sukuk issuances suggest that a well-developed Sukuk market would strengthen the ability of the IBs to find appropriate funds (and investment opportunities) to improve their capital adequacy ratios.

Based on the above, we conjecture that:

H1: Sukuk market development has a positive effect on IBs' capitalization ratios

Why might Sukuk market development negatively affect IBs' capitalization ratio?

Despite the above arguments in favour of a positive relationship between the development of the Sukuk market and IBs' capitalizations, existing finance theory might suggest an adverse effect.

Sukuk market offers direct and probably less costly funding opportunities to corporates and other actors in the economy. The presence of a well-developed Sukuk market might reduce the market share of banks and tighten competition between them. Public and large corporations (presumably less risky entity) would prefer and heavily rely on Sukuk markets in their financing as well as investing activities. This leaves the banks dealing mostly with young private firms (presumably the riskiest entities in the economy) who usually have no (or less) capacity to access capital markets due to their sizes, ages, or resources. Consequently, banks would adopt more aggressive lending policies, resulting in lower loan

quality and increased risk on the assets side of their balance sheets. This, in turn, would increase the denominator of the capital adequacy ratio. Consistent with this explanation, Keeley (1990) and Jimenez and Lopez (2007) argue that increased competition between U. S. banks resulted in greater risk-taking. In fact, when competition is high, banks may take more risks as competition reduces their profits.

Prior studies (Kane, 1989; Cole et al., 1995; among others) also suggest that in situations where banks face high competition (from other banks or from the financial markets as in our case), banks tend to "gamble" by investing in risky portfolio that pays out high returns if the gamble succeeds while leaving the depositors with the losses if the gamble fails (Hellman et al., 2000). In their model, Hellman et al. (2000) argue that regulators who are aware of such behaviour usually use "*capital requirements [to] force banks to have more of their own capital at risk so that they internalize the inefficiency of gambling*." Consequently, banks would react and smartly behave in a way that reduces their exposed capital (i.e. reduce their capitalization ratios). Consistent with this view, many studies argue that competition increases banks' risk-taking behaviour and suggest that banks will be forced to function with a minimum capital "buffer" to reduce their capital at risk (Hellman et al., 2000; Allen and Gale, 2004). This strategy seems to be more plausible for IBs. Indeed, existing literature argues that IBs are very well capitalized (Turk-Ariss, 2010; Beck et al., 2013; Bitar et al., 2017) with an average capital adequacy ratio and a Tier 1 ratio of 17.3% and 15.6%, respectively (IFSB, 2017)[8]. The same report also highlights the declining trend in these ratios[9]. Although the IFSB (2017)'s report does not provide a solid explanation for this decline, the effect of competition on the bank's behaviour might suggest a

[8] These ratios are calculated excluding Iran. Iranian banks experienced a very sharp decline in the capital adequacy ratios during the year 2016. If Iranian banks were included, the total CAR and the Tier-1 capital ratios would be 12.1% and 9.7%, respectively.

[9] The IFSB's 2016 report on Islamic banks states that "The average adequacy ratio was above 20% in 2008, since then it has been declining."

good explanation for this phenomenon. More importantly, the recent development of Sukuk markets in the countries covered in the IFSB (2017)'s report makes our above reasoning even more credible. Those countries have witnessed a huge development in their Sukuk markets with more Sukuk issues are now being traded and better regulations have been put in place. Our reasoning suggests that such development might increase competition between IBs forcing them to increase the riskiness of their portfolios (i.e. the denominator of the CAR) and/or reducing their CAR towards the minimum requirement.

In this backdrop, we posit the following completing hypothesis:

H2: Sukuk market development has a negative effect on IBs' capitalization ratios

4. Data and Variables

In this section, we present our data sources and define the variables used in the empirical analysis.

4.1. Data

The data on Sukuk issuances are gathered from Bloomberg. The data on macroeconomic variables are collected from the World's Bank World Development Indicators (WDI), while the data on banks' characteristics are obtained from Bankscope. The sample size is constrained by the availability of the data on Sukuk issuances. To ensure a time series dimension to our data, our sample includes all the countries for which we observe at least three annual Sukuk data over the study period[10]. After applying this selection procedure, we obtained an unbalanced panel of 230 IBs from 13 countries spanning the period 2005-2014. Table 1 presents the list of the countries included in our sample.

[10] Hence, Bermuda, Cayman Islands, and Luxembourg are eliminated from our sample for lack of Sukuk data.

[Insert Table 1 about here]

4.2. Description of Variables

4.2.1. The dependent variable: Bank capitalization

We measure IB's capitalization using three ratios, following Jacques and Nigro (1997), Aggrawal and Jacques (2001), and Rime (2001). First, we employ the capital adequacy ratio (CAR) obtained by the ratio of total capital to risk-weighted assets. Second, we use the Tier1 capital ratio (TIER1) equal to the Tier 1 capital to risk-weighted assets. Finally, we use the capital ratio (CTA) obtained by the ratio of total capital to total assets.

4.2.2. The independent variables

4.2.2.1. Sukuk market development

We measure Sukuk market development (SMD) with the ratio of Sukuk market capitalization as a share of GDP (Smaoui et al., 2017). This variable represents the depth of Sukuk markets. As discussed earlier, two competing hypotheses are advanced. In the first one, we conjecture that Sukuk market development positively influences IBs' capitalization ratios. However, in an alternative hypothesis, we posit that the level of development of Sukuk markets has a negative impact on IBs' capital ratios.

4.2.2.2. Country-level control variables

We use two country-level variables to control for the effects of macroeconomic factors on IBs' capital. First, we control for GDP growth (GROWTH) measured by the difference of the log of real GDP per Capita (Barro, 1991). Prior studies suggest that banks tend to increase their capital ratios during economic booms due to the rapid expansion of credit growth and/or the fall of lending standards (Vithessonthi, 2014). Hence, we expect a positive relationship between GDP growth and Islamic banks' capitalization.

Second, we control for the impact of trade openness (OPEN) on Islamic bank's capital. Trade openness increases demand and encourages countries to undertake financial liberalization reforms, which will promote competition in the financial sector. This higher competition is likely to induce IBs to adjust their capital ratios (Schaeck and Cihak, 2012). We measure trade openness by the sum of exports and imports of goods and services as a share of GDP. In this backdrop, we expect a positive association between trade openness and bank capitalization.

4.2.2.3. Bank-level control variables

In this section, we describe the bank-level control variables and their expected effect on IBs' capitalization. These variables have been extensively used in the literature on bank capital (Aggrawal and Jacques, 1998; Rime, 2001; Schaeck and Cihak, 2012; etc.).

Bank size (SIZE)

Previous empirical literature suggests that larger banks tend to hold less capital (Calmes and Theoret, 2013; Rime, 2001; among others). They attribute this result to the "too-big-to-fail" hypothesis whereby larger banks must be supported by governments when they face potential failure (Balasubramnian and Cyree, 2011; Daley et al., 2008, Frexias and Rochet, 2013; Soedarmono et al., 2013). We control for bank size using the natural logarithm of total assets. We expect a negative relationship between bank size and bank capital holding.

Asset quality (LLR)

The ratio of loan loss reserves to gross loans measures the quality of a bank's assets (Altunbas et al., 2007). A higher amount of LLR leads to a higher amount of RWA, and, hence, lower bank capital ratios. Therefore, we expect a negative effect of LLR on the bank's capital ratios.

Bank liquidity

According to the pecking order theory, more bank liquid assets will lead to lower information asymmetry and, hence, higher ability to issue equity (Belkhir et al., 2016). Therefore, we expect a positive relationship between liquidity and IB's capital. We control for the effect of bank liquidity on bank capital using the ratio of liquid assets to deposits and short-term funding (LIQUID) and the ratio of net loans to total assets (NLTA).

Bank profitability

A bank's current profits may have a positive effect on bank's capital adequacy ratios if banks are willing to increase their social capital through retained earnings rather than issuing new seasoned stock offerings (Rime, 2001). We measure bank profitability using the return on assets (ROA) and return on equity (ROE). Flannery and Rangan (2008) find a positive relationship between profitability and capital of conventional banks. We, therefore, expect a positive relationship between ROA (ROE) and the bank's capital ratios. Table 2 displays our variables definitions, proxies, and expected signs.

[Insert Table 2 about here]

5. Model and Methodology

In this paper, we investigate whether the development of Sukuk markets incentivizes IBs to hold higher or lower capital ratios. In this section, we describe our empirical model and the estimation procedure used to examine the effects of Sukuk market development on IB's capital. Our cross-section-time-series panel model can be written as follows:

$$bcr_{i,j,t} = \alpha + \beta_1 smd_{j,t} + \delta mcon_{j,t} + \gamma bcon_{i,j,t} + \mu_{i,j} + \varepsilon_{i,j,t}$$

Where $bcr_{i,j,t}$ stands for one of our measures of bank capital ratios (CAR, TIER 1, or CTA) of IB *i* in country *j* at time t; $smd_{j,t}$ denotes Sukuk market development for country *j* at time *t;* $mcon_{j,t}$ is the

vector of country-level control variables described earlier for country *j* at time *t*; $bcon_{i,j,t}$ is the vector of bank-level control variables for bank *i* in country *j* at time *t;* $\mu_{i,j}$ is the unobserved bank-specific effet, and $\varepsilon_{i,j,t}$ is the zero-mean disturbance term.

We tested for the presence of serial correlation in the series of residuals, $\varepsilon_{i,j,t}$, using the Wooldridge (2002) test. The null hypothesis posits that the residuals are not temporally correlated (i.e. the model does not suffer from serial correlation[11]). In our case, the evidence shows that the residuals are serially correlated, so we reject the null hypothesis. Furthermore, we tested for the presence of heteroscedasticity in the residuals using the modified Wald's test[12]. Estimation results indicate that fixed effects estimation errors do not present constant variances across countries. Finally, we applied the Friedman's test in order to test for the presence of contemporaneous correlation. The results confirm the presence of contemporaneous correlation across panels in the error series.

To tackle these econometric problems, we estimate our model (1) using the Prais-Winston estimation procedure, which produces panel corrected standard error (PCSE) estimates for linear panel data models. When computing the standard errors and the variance-covariance estimates, the disturbances are assumed heteroskedastic and contemporaneously correlated across panels.

6. Empirical results

6.1. Descriptive statistics

[11] Wooldridge´s (2002) method consists on estimating the first differences version of the model to check if residuals are serially correlated. So, if μ_i are not serially correlated, then $\mathrm{Corr}(\Delta\mu_{i,t}, \Delta\mu_{i,t-1}) = -0.5$ and we can conclude that the errors of the model are uncorrelated (Drukker, 2003).

[12] Besides the modified Wald test, there exist alterative tests that could be used to test for the presence of heteroscedasticity in panel data estimations (such as the Breusch-Pagan test). However, most of them -except the modified Wald test- are sensitive to the error normal distribution assumption (Green, 2000). All tests´ results, i.e. Wald, Wooldridge and Friedman´s tests, are available to the reader upon request.

Table 3 displays the descriptive statistics for our main variables. We notice that the average capital ratio for our sample of IBs is 23.76% for CAR, 22.27% for TIER1, and 25.91% for CTA. We also see from Table 3 that capital ratios exhibit a very high variation across our sample of IBs, with a standard deviation of 24.14% for CAR, 24.77% for TIER1, and 26.051% for CTA. Moreover, the average Sukuk market development for our sample countries over the sample period amount to 1.47%, with a maximum of 18.17% for Malaysia.

[Insert Table 3 about here]

Table 4 presents the correlations coefficients of the main variables used in our regressions. As expected, CAR, TIER1, and CTA are highly negatively correlated, with correlations ranging from 0.96 to 0.99. In addition, Capital ratios are negatively correlated with SIZE, LIQUID, and ROE, while positively correlated with NLTA.

[Insert Table 4 about here]

6.2. Multivariate analysis

In this section, we analyze the results of the panel regressions estimated with the Prais-Winston procedure using an unbalanced panel data set comprising 230 Islamic banks over the period 2005-2014. The presence of outliers could affect our results on the effect of Sukuk market development on capital ratios of IBs. To tackle this issue, we eliminate observations that are beyond three standard deviations.

In Table 5, we test the impact of Sukuk market development (SMD) on the CAR of IBs. We notice that SMD is negatively and significantly related to CAR at the 1% significance level across all the

specifications. This result suggests that the recent development of Sukuk markets has encouraged IBs to reduce their capital adequacy ratios, which supports our hypothesis H2 that Sukuk market development exerts a negative effect on IBs' capitalization ratios. Indeed, the coefficient of (-0.625) of SMD in specification (1) implies that a 1% increase in SMD will result, on average, in a decrease of 0.625% in CAR of IBs during the period 2005-2014. Moreover, the coefficients of GROWTH display the expected positive sign but insignificant at conventional levels. As expected, we find that OPEN is positively and significantly associated with CAR at the 1% significance level, whatever the specification.

Turning to our bank-level control variables, the results in Table 5 show that SIZE loads negative and significant at the 1% level for all our specifications. This result corroborates the "too-big-to-fail" effect whereby larger IBs must be supported by governments when they face potential failure (Balasubramnian and Cyree, 2011; Daley et al., 2008, Frexias and Rochet, 2013; Soedarmono et al., 2013). In addition, our liquidity variables (LIQUID and NLTA) are significant at the 5% level across all our specifications and display the expected signs, implying that lower liquidity levels indicate poor cash reserves, and, hence, higher risk-weighted assets, which will decrease IBs' capital holdings. These findings are consistent with prior empirical studies on CBs (Calmes and Theoret, 2013; Rime, 2001; Vithessonthi, 2014, etc.). Further, the assets quality variable (LLR) displays the expected negative sign but statistically significant only in models (3) and (4). Therefore, we partially confirm our assumption that higher levels of LLR lead to lower capital adequacy ratios. Finally, the results in Table 5 show that the profitability of IBs is negatively related to CAR but insignificant at the 5% significance level. We, therefore, conclude that profitable IBs do not use their retained earnings to ameliorate their capital adequacy ratios, all else being equal. This partially supports our conjecture that IBs, in the presence of more developed Sukuk markets, reduce their capitals to the minimum

required (or at least avoid increasing it using retained earnings). By adopting such a strategy, IBs are able to reduce their capital at risk while shifting the risk to depositors and other capital providers (e.g. creditors).

[Insert Table 5 about here]

Table 6 presents the results of the regressions on the impact of Sukuk market development on TIER1 capital ratio. We see that SMD is negatively and significantly associated with TIER1. This result is consistent with our hypothesis H2 and suggests that the depth of Sukuk markets has incentivized IBs to reduce their TIER1 capital ratios. The effect is economically significant. For instance, in model (1), the coefficient of SMD (-0.688) implies that a 1% increase in SMD will result, on average, in a decrease of TIER1 by 0.688% of our sample of IBs during the period 2005-2014. In addition, the coefficients associated with OPEN are all positive and significant at the 1% level suggesting that trade openness has had a positive effect on TIER1 capital ratios, which confirms our prediction.

Consistent with our previous results, the coefficients of LLR display the expected negative sign and significant in all our specifications, except in model (1). This result suggests that higher levels of LLR will result in lower capital ratios of IBs. As expected, SIZE is negatively and significantly related to TIER1 across all our specifications, thus confirming the presence of the "too-big-to-fail" effect. In addition, our liquidity variables display the expected sign and are significant at the 1% level in all our regressions. This result is consistent with the pecking order theory and suggests that more bank liquid assets will lead to lower information asymmetry and, hence, higher ability to issue equity. Finally, bank profitability is not significantly related to TIER1.

[Insert Table 6 about here]

The results that appear in Table 7 show that SMD is negatively associated with the Capital-to-Total-Assets ratio (CTA) and is significant at the 1% level across all our specifications. This result suggests that the development of Sukuk markets has increased competition between Islamic banks forcing them to increase the riskiness of their portfolios by reducing their capital ratios towards the minimum required level, which supports our competing hypothesis H2.

From Table 7, we notice that the results for our control variables are consistent with those displayed in Tables 5 and 6. Indeed, trade openness and bank liquidity are positively and significantly related to CTA, while SIZE and LLR are negatively and significantly related to CTA. Finally, economic growth and bank profitability load insignificant at the 5% significance level.

[Insert Table 7 about here]

Overall, the evidence shows that the recent development of Sukuk markets has had a negative impact on IBs' capitalization, as measured by CAR, TIER1, and CTA. This result could be explained by the fact that IBs could have increased their risk-taking levels by shifting business to more risky borrowers (small firms and/or low credit quality firms from the private sector) as competition becomes stronger following a loss of business from low risk and public firms who enjoy (and benefit from) an easy access to Sukuk markets. The higher bank's portfolio risk would translate into higher risk-weighted assets[13] and, hence, leading to the decrease of capital ratios. Alternatively, IBs could have issued a certain quality of Sukuk that do not qualify for Tier 1 or Tier 2 capital. This Sukuk issuance has increased the financial leverage of IBs and decreased their capital ratios. In addition, larger banks seem to hold less capital, thus confirming the "too-big-to-fail" paradigm widely documented in the banking

[13] The denominator of the Capital Adequacy Ratio (CAR).

literature (Balasubramnian and Cyree, 2011; Daley et al., 2008, Frexias and Rochet, 2013; Soedarmono et al., 2013). As expected, higher asset quality and better liquidity lead to an increase in the capital ratios of IBs. Finally, the insignificant impact of bank profitability on bank capital suggests that profitable IBs do not use their retained earnings to improve their capital ratios.

6.3. Robustness checks

To assess the robustness of our results, we conduct a battery of tests that allow us to address issues related to sovereign versus corporate Sukuk, endogeneity of explanatory variables, and control for banking competition.

Sovereign Sukuk versus Corporate Sukuk

In some countries, such as Saudi Arabia, corporate Sukuk markets are more developed than sovereign markets. In other countries, Sukuk markets are mainly dominated by issuances from the government, as it is the case in the UK, for instance, and Jordan. In countries like Malaysia, Bahrain, and UAE, the Sukuk market is relatively equally developed for the sovereigns as well as for the corporates. Hence, it is possible that the negative effect of Sukuk market development on IBs' capitalization depends on the type of Sukuk: sovereign versus corporate. To test for this possibility, we estimate our model using two independent variables: (a) sovereign Sukuk market development measured by the ratio of sovereign Sukuk issuances to GDP (SSMD), (b) corporate Sukuk market development measured by the ratio of corporate Sukuk issuances to GDP (CSMD). The results that appear in Tables 8 and 9 show that this treatment leads to similar findings. Thus, the development of both sovereign and corporate markets is negatively and significantly (p-value less than 1%) related to CAR in all our regressions, which confirms our hypothesis H2. The results for the control variables are similar to those presented in Table 5.

[Insert Tables 8 and 9 about here]

Endogeneity

Thus far, we have estimated our model assuming that all our explanatory variables are strictly exogenous. However, it is possible that the level of capitalization of IBs influences the development of Sukuk markets. For instance, IBs with excess capital ratios may decide to lower their capitalization by issuing Sukuk, which are less costly than equity, thereby reducing their cost of capital. In addition, it is likely that the capitalization of IBs influences its profitability. Banks holding higher capital ratios will incur a higher cost of capital and, hence, will exhibit lower profitability, everything else being equal. Therefore, SMD and ROA may be endogenous to capital ratios.

We control for the endogeneity of Sukuk market development and bank profitability in our regressions using the system GMM estimation technique of Blundell and Bond (1998). This procedure combines, within a system, the regression in levels and the regression in first-differences. The instruments for the first regression are the lagged differences of the endogenous and exogenous variables. For the second regression, lagged endogenous and exogenous variables previous or equal to (t-2) are used as instruments.

It is worth noting that the validity of the system GMM estimator rests on two hypotheses: (1) the instruments used are overall valid, and (2) error terms do not exhibit serial correlation. To test both hypotheses, we run two specification tests proposed by Hansen (1982) and Arellano and Bond (1991). The first is a test of over-identifying restrictions that tests the validity of our instruments. The second assesses whether the residual shows second-order serial correlation. The non-rejection of both null hypotheses gives support to our specification. Tables 10, 11, and 12 report the results of the system GMM estimations respectively for CAR, TIER1, and CTA. We notice that all our model specifications pass, at the 5% significance level, the Hansen test and the AR2 test. This confirms that our instruments

are valid and that the differenced error terms exhibit no second-order correlation. Thus, our system GMM estimator is consistent.

As reported in Table 10, we still document a negative and significant impact of Sukuk market development on CAR. All the coefficients of trade openness are positive and highly significant (p-value less than 5%), thus confirming our earlier findings. In addition, SIZE is negatively and significantly related to CAR, as expected. However, the coefficients of LLR and LIQUID show their expected signs, but no longer significant at conventional levels.

The results displayed in Table 11 show that the coefficients of SMD are negative and highly significant at the 1% significance level. Moreover, the coefficients of economic growth are expectedly positive and significant in models (1) and (3), which is consistent with our previous findings. Further, OPEN is positively related to TIER1 but significant only in model (3). The results for the remaining control variables remain unchanged.

Table 12 shows the results of the system GMM regressions with CTA as a dependent variable. The evidence shows a negative and significant impact of SMD on CTA, thus confirming our hypothesis H2. However, LLR is no longer significantly related to CTA. In addition, the coefficients of ROE are positive and significant at the 5% level in model (2) and at the 10% level in model (4). We, therefore, confirm our prediction that bank profitability has a positive impact on the capital ratios of IBs, everything else being equal. Finally, the results for the remaining control variables are similar to our original findings.

[Insert Tables 10, 11, and 12 about here]

Banking Competition

Our findings point out to the possibility that the development of Sukuk markets may have increased competition between IBs forcing them to increase the riskiness of their portfolios by reducing their capital ratios towards the minimum required level. To test for this possibility, we control for the competition in the banking sector using the H-Statistic, which measures the elasticity of banks revenues relative to input prices. Under perfect competition, an increase in input prices raises both marginal costs and total revenues by the same amount, and hence the H-statistic equals 1. Under a monopoly, an increase in input prices results in a rise in marginal costs, a fall in output, and a decline in revenues, leading to an H-statistic less than or equal to 0. When H-statistic is between 0 and 1, the system operates under monopolistic competition. According to Claessens and Laeven (2004), the H-Statistic is the most appropriate measure of the degree of competition. Moreover, it has been extensively used in the empirical banking literature (Claessens and Laeven, 2004; Staikouras and Koutsomanoli-Fillipaki, 2006; Schaeck and Cihak, 2012, among others).

Table 13 shows the results of the estimations of the regressions of the capital ratios (CAR, TIER1, and CTA) on Sukuk market development while controlling for banking competition. We notice that the coefficients of H-Statistic display the expected negative sign (except in specification (5) where the coefficient is positive), but insignificant at the 5% level, whatever the specification. In specifications (2), (4), and (6), we control for the interaction between SMD and the H-Statistic in order to test the effect of SMD on capital ratios at different levels of competition. Interestingly, the interaction variable is negatively and significantly associated with the capital ratios, across all our specifications. In addition, the coefficients of SMD are all negative and significant at the 1% level. These findings confirm our conjecture that the development of Sukuk markets may have stimulated competition between IBs, inducing them to hold lower capital ratios and increase the riskiness of their portfolios of assets. This is consistent with the results of Smaoui et al. (2017) who show that the issuance of

Sukuk may deprive the banking system from market share, forcing IBs to reduce their capital ratios. The results for the remaining control variables are qualitatively similar to our original findings.

[Insert Table 13 about here]

Overall, the evidence we report suggests that Sukuk market development exerts an adverse effect on the capital ratios of IBs. This result is robust to the control for the type of Sukuk, the treatment of the endogeneity of explanatory variables, and the control for the degree of competition in the banking sector.

7. Conclusion

In this paper, we investigate empirically the impact of Sukuk market development on bank capitalization for a sample of 230 Islamic banks over the period 2005-2014. We posit two competing hypotheses. The first hypothesis predicts a positive relationship between Sukuk market development on IBs' capitalization, while the second one suggests a negative relationship. Using both the Prais-Winston and system GMM estimation procedures, our empirical findings support the second hypothesis, i.e. that Sukuk market development exerts an adverse effect on IBs' capitalization. We explain our results by the fact that developed Sukuk markets might have tightened competition between IBs, which resulted in an aggressive risk-taking attitude by these banks. It is also possible that IBs, which used to be strongly capitalized in the past, started decreasing their capitalization ratios by reducing the amount of their capital at risk towards the minimum requirement. The declining trend in the CAR of IBs from 2008 to 2016 supports this conjecture.

Our findings are of utmost importance to regulators and decision makers. There is no doubt that countries are trying to develop their financial markets but also aspire to strengthen their banking systems to improve their resilience to shocks. What we have shown in this paper is that these two

objectives might not always move alongside. With the recent development of Fintech, crowd financing and the multiplication of other intermediation channels, we believe that countries will strive to protect their banking systems as they represent one of the economy's pillars. In doing so, regulators may be hesitant to promote any alternatives that would substitute to banks and threaten their stability.

References

Abdul-Rahman, A., Abdul Latif, R., Muda, R., Abdullah, M.A., 2014. Failure and potential of profit-loss sharing contracts: a perspective of New Institutional, Economic (NIE) Theory. Pacific-Basin Finance Journal 28, 136-151

Abedifar, P., Molyneux, P., Tarazi, A., 2013. Risk in Islamic banking. European Financial Review 17, 2035–2096.

Aggarwal, R., Jacques, K.T., 2001. The impact of FDICIA and prompt corrective action on bank capital and risk: Estimates using a simultaneous equations model. Journal of Banking and Finance 25, 1139- 1160.

Ahmad W., Radzi R.M., 2011. Sustainability of Sukuk and conventional bond during financial crisis: Malaysian capital market. Global Economy and Finance Journal 4, 1-14.

Ahmed, H., Khan, T., 2007. Risk management in Islamic banking. in M. Kabir Hasan and Mervyn K. Lewis (eds), Handbook of Islamic Banking (UK: Edward Elgar), 144 – 160.

Alam, N., Hassan, M.K., Aminul-Haque, M., 2013. Are Islamic bonds different from conventional bonds? International evidence from capital market tests. Borsa Istanbul Review 13(3), 22-29.

Allen, F., Gale, D., 2004. Competition and financial stability. Journal of Money, Credit and Banking, 453–480.

Altunbas, Y., Carbo, S., Gardener, E.P.M., and Molyneux, P., 2007. Examining the relationships between capital, risk and efficiency in European banking. European Financial Management 13, 49–70.

Arellano, M., Bover, O., 1995. Another look at the instrumental variable estimation of error-component models. Journal of Econometrics 68(1), 29-51.

Arellano, M., Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. The Review of Economic Studies 58(2), 277-297.

Ashhari, Z.M., Chun, L.S., Nassir, A.M., 2009. Conventional vs Islamic Bond announcements: the effects on shareholders' wealth. International Journal of Business and Management, 4(6), 2009, 105-111.

Balasubramnian, B., Cyree, K.B. (2011). Market discipline of banks: Why are yield spreads on bank-issued subordinated notes and debentures not sensitive to bank risks? Journal of Banking and Finance 35, 21–35.

Barro, R.J., 1991. Economic Growth in a Cross Section of Countries. Quarterly Journal of Economics 106(2), 407-433.

Beck, T., Demirguc-Kunt, A., Merrouche, O., 2013. Islamic vs. conventional banking: Business model, efficiency, and stability. Journal of Banking and Finance 37, 433–447.

Belkhir, M., Maghyereh, A., Awartani, B., 2016. Institutions and corporate capital structure in the MENA region. Emerging Markets Review 26, 99–129.

Bitar, M., Madiès, P., Taramasco, O., 2017. What makes Islamic banks different? A multivariate approach. Economic Systems 41(2), 215-235.

Boumediene, A., 2011. Is credit risk really higher in Islamic banks? Journal of Credit Risk 7, 97–129.

Calmes, C., Theoret, R. 2013. Market-oriented banking, financial stability and macro-prudential indicators of leverage. Journal of International Financial Markets, Institutions and Money 27, 13-34.

Chiu, W.C., Wan, C.W., Peña, J.I., 2017. Does the source of debt financing affect default risk? Review of Financial Economics, forthcoming.

Chong, B.S., Liu, M.-H., 2009. Islamic banking: interest-free or interest-based? Pacific-Basin Finance Journal 17, 125–144.

Cihak, M., Hesse, H., 2010. Islamic banks and financial stability: an empirical analysis. Journal of Financial Services Research 38, 95–113.

Claessens, S., Laeven, L., 2004. What drives bank competition? Some international evidence, Journal of Money, Credit, and Banking 36 (3), 563–83.

Cole, R.A., McKenzie, J.A., White, L.J., 1995. Deregulation gone awry: Moral hazard in the savings and loan industry. In The Causes and Costs of Depository Institution Failures. Springer Netherlands: 29-73.

Daley, J., Matthews, K., Whitfield, K., 2008. Too-big-to-fail: Bank failure and banking policy in Jamaica. Journal of International Financial Markets Institutions and Money 18, 290–303.

Drukker, D., 2003. Testing for serial correlation in linear panel-data models. Stata Journal 3(2), 168-177.

Errico, L., Sundararajan, V., 2002. Islamic Financial Institutions and Products in the Global Financial System: Key Issues in Risk Management and Challenges Ahead. International Monetary Fund Working Paper No. 02/192.

Flannery, M., Rangan, K., 2008. What caused the capital build-up of the 1990? Review of Finance 12, 2008, 391–429.

Freixas, X., Rochet, J. -C., 2013. Taming systemically important financial institutions. Journal of Money, Credit and Banking 45, 37–58.

Gamaginta, Rokhim R, 2015. The stability comparison between Islamic banks and conventional banks: Evidence in Indonesia. In H A El-Karanshawy et al. (Eds.), Financial stability and risk management in Islamic financial institutions. Doha, Qatar: Bloomsbury Qatar Foundation.

Godlewski, C., Turk-Ariss, R., Weill, L., 2013. Sukuk vs. conventional bonds: A stock market perspective. Journal of Comparative Economics 41(3), 745-761.

Godlewski, C., Turk-Ariss, R., Weill, L., 2016. Do the type of Sukuk and choice of shari'a scholar matter? Journal of Economic Behavior and Organization 132, 63-76.

Greene, W., 2000. Econometric Analysis. Prentice–Hall.

Hansen, L. P., 1982. Large sample properties of generalized method of moments estimators. Econometrica 50(4), 1029-1054.

Haque, M.M., Chowdhury, M. A. F., Buriev, A. A., Bacha, O. I., Masih, M., 2017. Who drives whom - Sukuk or bond? A new evidence from Granger causality and wavelet approach. Review of Financial Economics, forthcoming.

Hasan, M., Dridi, J., 2011. The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study. Journal of International Commerce, Economics and Policy 2(2), 163-200.

Hassan, M. K., Paltrinieri, A., Dreassi, A., Miani, S., Sclip, A., 2017. The determinants of co-movement dynamics between Sukuk and conventional bonds. Quarterly Review of Economics and Finance, forthcoming.

Hellmann, T.F., Murdock, K., Stiglitz, J., 2000. Liberalization, moral hazard in banking and prudential regulation: are capital requirements enough? American Economic Review 90, 147–165.

Islamic Financial Services Board (IFSB), 2013. Revised Capital Adequacy Standard For Institutions Offering Islamic Financial Services, IFSB-15.

Islamic Financial Services Board (IFSB), 2016. Islamic Financial Services Industry Stability Report.

Islamic Financial Services Board (IFSB), 2017. Islamic Financial Services Industry Stability Report.

Jacques, K.T., Nigro, P., 1997. Risk-Based Capital, Portfolio Risk, and Bank Capital: A Simultaneous Equations Approach. Journal of Economics and Business 49, 533-547.

Jimenez, G., Lopez, J.A., 2007. How does competition impact bank risk-taking? Journal of Financial Stability 9(2), 185-195.

Jobst, A., Kunzel, P., Mills, P., Sy, A., 2008. Islamic bond issuance – what sovereign debt managers need to know? International Journal of Islamic and Middle Eastern Finance and Management 1(4), 330-344.

Johnes, J., Izzeldin, M., Pappas, V., 2014. A comparison of performance of Islamic and conventional banks 2004–2009. Journal of Economic Behavior and Organization 103, 93-107.

Kabir, M. N., Worthington, A., Gupta, R., 2015. Comparative credit risk in Islamic and conventional bank. Pacific-Basin Finance Journal 34, 327–353.

Kabir, M.N., Worthington, A., 2014. Credit risk in Islamic financial products. In: Worthington, A.C. (Ed.), Contemporary Issues in Islamic Finance: Principles, Progress, and Prospects. Nova Publishing, New York, 73–84

Kane, E., 1989. The S&L insurance crisis: How did it happen? Washington, DC: Urban Institute Press.

Keeley, M.C., 1990. Deposit insurance, risk and market power in banking. American Economic Review 80, pp. 1183-1200.

Levine R., 2005. Finance and Growth: Theory and Evidence. In: Handbook of Economic Growth, Eds. Philippe Aghion and Steven N. Durlauf, Elsevier North Holland, 866-934.

Maghyereh, A.I., Awartani, B., 2016. Dynamic transmissions between Sukuk and bond markets. Research in International Business and Finance 38, 246-261.

Mollah, S., Zaman, M., 2015. Shari'ah supervision, corporate governance and performance: Conventional vs. Islamic banks. Journal of Banking and Finance 58, 418–435.

Pappas, V., Izzeldin, M., Fuertes, A.-M., 2012. A Survival Analysis of Islamic Bank Failure Risk. Mimeo, Lancaster University.

Rime, B., 2001. Capital requirements and bank behavior: Empirical evidence for Switzerland. Journal of Banking and Finance 25, 789-805.

Schaeck, K., Cihak, M., 2012. Banking competition and capital ratios. European Financial Management 18, 836–866.

Siddiqui, A., 2008. Financial contracts, risk and performance of Islamic banking. Managerial Finance 34, 680–694.

Smaoui H., Mimouni K., Temimi A., 2017. Sukuk, banking system, and financial markets: Rivals or complements? Economics Letters 161, 62-65.

Smaoui H., Nechi S., 2017. Does Sukuk market development spur economic growth? Research in International Business and Finance 41, 136-147.

Soedarmono, W., Machrouh, F., Tarazi, A., 2013. Bank competition, crisis and risk taking: Evidence from emerging markets in Asia. Journal of International Financial Markets Institutions and Money 23, 196–221.

Staikouras, C., Koutsomanoli-Fillipaki, A., 2006. Competition and concentration in the new European banking landscape, European Financial Management 12, 443–82.

Tariq, A.A., Dar, H., 2007. Risks of Sukuk Structures: Implications for Resource Mobilization. Thunderbird International Business Review 49, 2, 203–223.

Turk-Ariss, R., 2010. Competitive conditions in Islamic and conventional banking: a global perspective. Review of Financial Economics 19, 101–108.

Vithessonthi, C., 2014. The effect of financial market development on bank risk: evidence from Southeast Asian Countries. International Review of Financial Analysis 35, 249-260.

Windmeijer, F. 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics 126(1) 25-51.

Wooldridge, J. (2002), Econometric Analysis of Cross Section and Panel Data, MIT Press.

Table 1: Sample Countries

Country	Number of IBs
Bahrain	26
Bangladesh	10
Brunei	4
Indonesia	46
Kuwait	16
Malaysia	44
Pakistan	22
Qatar	9
Saudi Arabia	16
Singapore	1
Turkey	3
United Arab Emirates	27
Yemen	4
Total	230

Table 2: Definitions, Proxies and Expected Sign

Variables	Description	Label	Expected Sign
Dependent			
Capital ratio	Capital adequacy ratio	CAR	
	Tier1 capital ratio	TIER1	
	Capital to total assets	CTA	
Independent			
Sukuk	Sukuk market cap to GDP	SMD	+/-
Growth	Annual real GDP growth rate	GROWTH	+
Trade Openness	(Exports + imports) /GDP	OPEN	+
Size	Log (Total Assets)	SIZE	-
Asset Quality	Loan loss reserves/gross loans	LLR	-
Liquidity	Liquid assets/deposits & short-term funding	LIQUID	+
Liquidity	Net loans/total assets	NLTA	-
Profitability	Return on average assets	ROA	+
Profitability	Return on average equity	ROE	+

Table 3: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
CAR	804	23.760	24.141	0.151	99.98
TIER1	936	22.270	24.774	0.14	98.78
CTA	1,136	25.913	26.051	0.08	99.63
SMD	2,070	1.470	3.498	0	18.17
GROWTH	2,070	1.571	4.468	-17.341	14.309
OPEN	2,070	98.235	52.263	26.858	439.656
SIZE	2,070	14.177	2.002	4.770	19.026
LLR	1,379	5.382	9.741	0	100
NLTA	1,522	53.017	101.783	0.09	997.72
LIQUID	1,522	51.644	22.777	0.39	98.92
ROA	2,070	0.371	79.393	-35.99	38.250
ROE	2,052	7.321	82.834	-35.99	39.853

This table reports the descriptive statistics of our main variables for the sample of 230 Islamic banks for the period 2005-2014.

Table 4: Correlation matrix

	CAR	TIER1	CTA	SMD	GROWTH	OPEN	SIZE	LLR	NLTA	LIQUID	ROA	ROE
CAR	1.00											
TIER1	0.96	1.00										
CTA	0.97	0.99	1.00									
SMD	0.07	0.06	0.04	1.00								
GROWTH	-0.01	0.03	0.04	0.14	1.00							
OPEN	0.14	0.08	0.06	0.41	-0.21	1.00						
SIZE	-0.38	-0.35	-0.39	0.13	-0.05	0.18	1.00					
LLR	0.02	0.01	0.08	-0.05	-0.12	0.07	-0.21	1.00				
NLTA	0.41	0.432	0.47	-0.01	-0.02	0.05	-0.22	0.11	1.00			
LIQUID	-0.25	-0.22	-0.20	-0.04	0.12	-0.08	0.23	-0.45	-0.31	1.00		
ROA	-0.108	-0.04	0.03	0.00	0.05	-0.01	0.10	-0.34	-0.05	0.09	1.00	
ROE	-0.142	-0.12	-0.12	-0.00	0.08	-0.03	0.13	-0.31	-0.09	0.19	0.96	1.00

This table shows the correlation coefficients for the variables used in our main regression models. The sample period is 2005-2014. The definitions of our variables appear in Table 2.

Table 5: Impact of Sukuk Market Development on CAR

	Dependent Variable: CAR			
Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**
SMD	-0.625***	-0.622***	-0.676***	-0.609***
	(0.000)	(0.000)	(0.001)	(0.007)
GROWTH	0.0002	0.0003	0.0011	0.0002
	(0.861)	(0.815)	(0.409)	(0.468)
OPEN	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
LLR	-0.156	-0.202	-0.514***	-0.553***
	(0.344)	(0.124)	(0.000)	(0.000)
SIZE	-0.039***	-0.039***	-0.046***	-0.048***
	(0.000)	(0.000)	(0.000)	(0.000)
LIQUID	0.0824***	0.0824***		
	(0.000)	(0.000)		
NLTA			-0.404***	-0.403***
			(0.000)	(0.000)
ROA	-0.145		-0.512	
	(0.464)		(0.111)	
ROE		-0.0374		-0.0504
		(0.261)		(0.224)
CONSTANT	0.718***	0.718***	1.104***	1.138***
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R2	0.483	0.486	0.469	0.462
N	754	754	758	758

This table shows the results of the regressions estimated with the Prais-Winston procedure for our sample of 230 Islamic banks for the period 2005-2014. The dependent variable is the Capital Adequacy Ratio (CAR). The definitions of our explanatory variables appear in Table 2. The Prais-Winston technique produces panel corrected standard error (PCSE) estimates for linear panel data models. When computing the standard errors and the variance-covariance estimates, the disturbances are assumed to be heteroskedastic and contemporaneously correlated across panels. The p-values appear in parentheses below the estimated coefficients. ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 6: Impact of Sukuk Market Development on Tier1 Capital Ratio

	Dependent Variable: Tier1			
Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**
SMD	-0.688***	-0.692***	-0.698***	-0.646***
	(0.000)	(0.000)	(0.001)	(0.003)
GROWTH	0.0002	0.0004	0.0009	0.0008
	(0.856)	(0.769)	(0.506)	(0.538)
OPEN	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
LLR	-0.192	-0.273**	-0.452***	-0.519***
	(0.176)	(0.019)	(0.000)	(0.000)
SIZE	-0.044***	-0.043***	-0.054***	-0.055***
	(0.000)	(0.000)	(0.000)	(0.000)
LIQUID	0.099***	0.100***		
	(0.000)	(0.000)		
NLTA			-0.303***	-0.298***
			(0.000)	(0.000)
ROA	0.0145		-0.405	
	(0.944)		(0.191)	
ROE		-0.0460		-0.0611
		(0.205)		(0.150)
CONSTANT	0.765***	0.756***	1.150***	1.160***
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R2	0.460	0.464	0.405	0.404
N	850	850	854	854

This table shows the results of the regressions estimated with the Prais-Winston procedure for our sample of 230 Islamic banks for the period 2005-2014. The dependent variable is the Tier1 Capital Ratio (TIER1). The definitions of our explanatory variables appear in Table 2. The Prais-Winston technique produces panel corrected standard error (PCSE) estimates for linear panel data models. When computing the standard errors and the variance-covariance estimates, the disturbances are assumed to be heteroskedastic and contemporaneously correlated across panels. The p-values appear in parentheses below the estimated coefficients. ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 7: Impact of Sukuk Market Development on CTA

	Dependent Variable: CTA			
Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**
SMD	-0.581***	-0.590***	-0.593***	-0.569***
	(0.000)	(0.000)	(0.004)	(0.006)
GROWTH	0.0002	0.0004	0.0008	0.0008
	(0.852)	(0.729)	(0.576)	(0.601)
OPEN	0.0008***	0.0008***	0.0009***	0.0009***
	(0.000)	(0.000)	(0.000)	(0.000)
LLR	-0.046	-0.005	-0.188	-0.143***
	(0.344)	(0.978)	(0.318)	(0.000)
SIZE	-0.065***	-0.063***	-0.075***	-0.076***
	(0.000)	(0.000)	(0.000)	(0.000)
LIQUID	0.089***	0.090***		
	(0.000)	(0.000)		
NLTA			-0.313***	-0.308***
			(0.000)	(0.000)
ROA	0.425		-0.194	
	(0.131)		(0.551)	
ROE		-0.015		-0.019
		(0.603)		(0.572)
CONSTANT	1.124***	1.099***	1.507***	1.503***
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R2	0.509	0.511	0.477	0.477
N	1032	1032	1037	1037

This table shows the results of the regressions estimated with the Prais-Winston procedure for our sample of 230 Islamic banks for the period 2005-2014. The dependent variable is the Capital to Total Assets ratio (CTA). The definitions of our explanatory variables appear in Table 2. The Prais-Winston technique produces panel corrected standard error (PCSE) estimates for linear panel data models. When computing the standard errors and the variance-covariance estimates, the disturbances are assumed to be heteroskedastic and contemporaneously correlated across panels. The p-values appear in parentheses below the estimated coefficients. ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 8: Impact of Sovereign Sukuk Market Development on CAR

	Dependent Variable: CAR			
Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**
SSMD	-2.218***	-2.204***	-2.282***	-2.106***
	(0.000)	(0.000)	(0.001)	(0.000)
GROWTH	0.0002	0.0003	0.0010	0.0010
	(0.840)	(0.808)	(0.445)	(0.491)
OPEN	0.0009***	0.0009***	0.0009***	0.0010***
	(0.000)	(0.000)	(0.000)	(0.000)
LLR	-0.111	-0.163	-0.465***	-0.513***
	(0.427)	(0.143)	(0.000)	(0.000)
SIZE	-0.039***	-0.039***	-0.047***	-0.049***
	(0.000)	(0.000)	(0.000)	(0.000)
LIQUID	0.083***	0.082***		
	(0.000)	(0.000)		
NLTA			-0.392***	-0.393***
			(0.000)	(0.000)
ROA	-0.137		-0.486	
	(0.502)		(0.157)	
ROE		-0.034		-0.046
		(0.334)		(0.281)
CONSTANT	0.721***	0.722***	1.112***	1.143***
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R2	0.488	0.487	0.461	0.456
N	754	754	758	758

This table shows the results of the regressions estimated with the Prais-Winston procedure for our sample of 230 Islamic banks for the period 2005-2014. The dependent variable is the Capital Adequacy Ratio (CAR). The definitions of our explanatory variables appear in Table 2. SSMD is sovereign Sukuk market development. The Prais-Winston technique produces panel corrected standard error (PCSE) estimates for linear panel data models. When computing the standard errors and the variance-covariance estimates, the disturbances are assumed to be heteroskedastic and contemporaneously correlated across panels. The p-values appear in parentheses below the estimated coefficients. ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 9: Impact of Corporate Sukuk Market Development on CAR

	Dependent Variable: CAR			
Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**
CSMD	-0.784***	-0.779***	-0.846***	-2.106***
	(0.000)	(0.000)	(0.004)	(0.000)
GROWTH	0.0001	0.0002	0.0010	0.0010
	(0.932)	(0.889)	(0.448)	(0.491)
OPEN	0.0010***	0.0010***	0.0010***	0.0010***
	(0.000)	(0.000)	(0.000)	(0.000)
LLR	-0.164	-0.208	-0.520***	-0.513***
	(0.344)	(0.123)	(0.000)	(0.000)
SIZE	-0.039***	-0.039***	-0.046***	-0.049***
	(0.000)	(0.000)	(0.000)	(0.000)
LIQUID	0.082***	0.082***		
	(0.000)	(0.000)		
NLTA			-0.404***	-0.402***
			(0.000)	(0.000)
ROA	-0.141		-0.503	
	(0.485)		(0.116)	
ROE		-0.037		-0.050
		(0.262)		(0.224)
CONSTANT	0.721***	0.722***	1.106***	1.139***
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R2	0.483	0.484	0.468	0.463
N	754	754	758	758

This table shows the results of the regressions estimated with the Prais-Winston procedure for our sample of 230 Islamic banks for the period 2005-2014. The dependent variable is the Capital Adequacy Ratio (CAR). The definitions of our explanatory variables appear in Table 2. CSMD is corporate Sukuk market development. The Prais-Winston technique produces panel corrected standard error (PCSE) estimates for linear panel data models. When computing the standard errors and the variance-covariance estimates, the disturbances are assumed to be heteroskedastic and contemporaneously correlated across panels. The p-values appear in parentheses below the estimated coefficients. ***, **, * refer to the 1, 5 and 10% levels of significance respectively.

Table 10: Control for Endogeneity: Impact of Sukuk Market Development on CAR

	Dependent Variable: CAR			
Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**
SMD	-0.465***	-0.433***	-0.491***	-0.517**
	(0.000)	(0.002)	(0.000)	(0.041)
GROWTH	0.0019**	0.0010	0.0019*	0.0012
	(0.044)	(0.295)	(0.053)	(0.125)
OPEN	0.0007***	0.0007**	0.0008***	0.0008**
	(0.005)	(0.026)	(0.005)	(0.016)
LLR	-0.196	-0.202	-0.183	-0.141
	(0.855)	(0.124)	(0.231)	(0.487)
SIZE	-0.026***	-0.026***	-0.033***	-0.031***
	(0.000)	(0.005)	(0.000)	(0.001)
LIQUID	0.068	0.055		
	(0.109)	(0.292)		
NLTA			-0.266***	-0.272**
			(0.020)	(0.029)
ROA	-0.419		-0.348	
	(0.107)		(0.379)	
ROE		0.001		0.053
		(0.987)		(0.516)
CONSTANT	0.534***	0.528***	0.811***	0.770***
	(0.000)	(0.000)	(0.000)	(0.000)
AR2 test	0.186	0.132	0.162	0.154
Hansen test	0.433	0.340	0.591	0.140
N	754	754	758	758

This table shows the results of the regressions estimated with the GMM in system procedure of Blundell and Bond (1998) for our sample of 230 Islamic banks for the period 2005-2014. The dependent variable is the Capital Adequacy Ratio (CAR). The definitions of our explanatory variables appear in Table 2. The Hansen (1982) test tests the validity of our instruments, while AR2 is the Arellano and Bond (1991) test of the absence of second-order autocorrelation in the differenced residuals. ***, **, * refer to the 1, 5 and 10% levels of significance respectively. The two-step system GMM estimator is used. Windmeijer (2005) finite-sample correction to the two-step covariance matrix is employed. Robust standard errors consistent in the presence of heteroscedasticity and autocorrelation within the panel are reported.

Table 11: Control for Endogeneity: Impact of Sukuk Market Development on Tier1

Dependent Variable: Tier1				
Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**
SMD	-0.350***	-0.275***	-0.420**	-0.358**
	(0.005)	(0.007)	(0.017)	(0.011)
GROWTH	0.0016**	0.0005	0.0021**	0.0012
	(0.037)	(0.543)	(0.019)	(0.235)
OPEN	0.0005	0.0004	0.0008**	0.0006
	(0.121)	(0.228)	(0.017)	(0.122)
LLR	0.008	0.919	-0.106	0.003
	(0.938)	(0.537)	(0.300)	(0.986)
SIZE	-0.023***	-0.027***	-0.038***	-0.039***
	(0.000)	(0.000)	(0.000)	(0.000)
LIQUID	0.119***	0.103***		
	(0.000)	(0.004)		
NLTA			-0.199**	-0.233**
			(0.042)	(0.032)
ROA	-0.119		0.051	
	(0.662)		(0.869)	
ROE		0.074		0.134
		(0.179)		(0.140)
CONSTANT	0.463***	0.526***	0.824***	0.866***
	(0.000)	(0.000)	(0.000)	(0.000)
AR2 test	0.253	0.171	0.138	0.344
Hansen test	0.775	0.333	0.455	0.115
N	850	850	854	854

This table shows the results of the regressions estimated with the GMM in system procedure of Blundell and Bond (1998) for our sample of 230 Islamic banks for the period 2005-2014. The dependent variable is the TIER1 Capital Ratio (Tier1). The definitions of our explanatory variables appear in Table 2. The Hansen (1982) test tests the validity of our instruments, while AR2 is the Arellano and Bond (1991) test of the absence of second-order autocorrelation in the differenced residuals. ***, **, * refer to the 1, 5 and 10% levels of significance respectively. The two-step system GMM estimator is used. Windmeijer (2005) finite-sample correction to the two-step covariance matrix is employed. Robust standard errors consistent in the presence of heteroscedasticity and autocorrelation within the panel are reported.

Table 12: Control for Endogeneity: Impact of Sukuk Market Development on CTA

	Dependent Variable: CTA			
Explanatory Variables	**(1)**	**(2)**	**(3)**	**(4)**
SMD	-0.704**	-0.469**	0.829**	-0.784*
	(0.046)	(0.036)	(0.035)	(0.069)
GROWTH	0.0013	-0.0020	0.0023**	0.0017
	(0.162)	(0.355)	(0.011)	(0.116)
OPEN	0.0007***	0.0007***	0.0012***	0.0012***
	(0.001)	(0.005)	(0.000)	(0.000)
LLR	0.120	0.239	0.010	0.154
	(0.495)	(0.289)	(0.965)	(0.516)
SIZE	-0.031***	-0.032***	-0.055***	-0.047***
	(0.001)	(0.002)	(0.000)	(0.000)
LIQUID	0.138***	0.126***		
	(0.000)	(0.001)		
NLTA			-0.154*	-0.249**
			(0.062)	(0.022)
ROA	0.845		1.833	
	(0.189)		(0.160)	
ROE		0.320**		0.396*
		(0.016)		(0.071)
CONSTANT	0.569***	0.564***	1.018***	0.909***
	(0.000)	(0.000)	(0.000)	(0.000)
AR2 test	0.082*	0.356	0.549	0.719
Hansen test	0.286	0.214	0.481	0.131
N	1032	1032	1037	1037

This table shows the results of the regressions estimated with the GMM in system procedure of Blundell and Bond (1998) for our sample of 230 Islamic banks for the period 2005-2014. The dependent variable is the Capital to Total Assets ratio (CTA). The definitions of our explanatory variables appear in Table 2. The Hansen (1982) test tests the validity of our instruments, while AR2 is the Arellano and Bond (1991) test of the absence of second-order autocorrelation in the differenced residuals. ***, **, * refer to the 1, 5 and 10% levels of significance respectively. The two-step system GMM estimator is used. Windmeijer (2005) finite-sample correction to the two-step covariance matrix is employed. Robust standard errors consistent in the presence of heteroscedasticity and autocorrelation within the panel are reported.

Table 13: Interaction between Competition and Sukuk Market Development

Dependent Variable	CAR	CAR	TIER1	TIER1	CTA	CTA
	(1)	(2)	(3)	(4)	(5)	(6)
SMD	-0.507***	-3.316***	-0.463***	-2.581***	--0.633***	-3.611***
	(0.003)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
GROWTH	0.0003	0.001	0.002	0.002	-0.0005	0.0006
	(0.898)	(0.762)	(0.300)	(0.264)	(0.845)	(0.801)
OPEN	0.0008***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
LLR	-0.473***	-0.449***	-0.359*	-0.358*	-0.373**	-0.377***
	(0.000)	(0.000)	(0.094)	(0.100)	(0.040)	(0.004)
SIZE	-0.043***	-0.042***	-0.040***	-0.040***	-0.048***	-0.047***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
NLTA	-0.288***	-0.310***	-0.278***	-0.307***	-0.317***	-0.339***
	(0.000)	(0.000)	(0.007)	(0.004)	(0.001)	(0.000)
ROA	-0.750	-0.757	-0.839**	-0.839**	-0.698*	-0.693
	(0.105)	(0.119)	(0.032)	(0.033)	(0.085)	(0.202)
H-Statistic	-0.0001		-0.005		0.054	
	(0.999)		(0.911)		(0.312)	
SMD*H-Statistic		-3.831***		-2.832***		-4.182***
		(0.000)		(0.002)		(0.000)
CONSTANT	0.997***	0.991***	0.913***	0.927***	1.042***	1.076***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted R2	0.452	0.477	0.396	0.407	0.532	0.564
N	473	473	482	482	567	567

This table shows the results of the regressions estimated with the Prais-Winston procedure for our sample of 230 Islamic banks for the period 2005-2014. The dependent variables are CAR, TIER1, and CTA. The H-Statistic measures the degree of competition in the banking sector. The definitions of our explanatory variables appear in Table 2. The Prais-Winston technique produces panel corrected standard error (PCSE) estimates for linear panel data models. When computing the standard errors and the variance-covariance estimates, the disturbances are assumed to be heteroskedastic and contemporaneously correlated across panels. The p-values appear in parentheses below the estimated coefficients. ***, **, * refer to the 1, 5 and 10% levels of significance respectively.