

# The Determinants of Sukuk Market Development

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## Abstract

The objective of this paper is to empirically investigate the structural, financial, developmental, institutional, and macroeconomic determinants of Sukuk market development for a sample of 13 countries over the period 2001-2013. We employ the system GMM procedure to tackle the problems of endogeneity of lagged dependent variable, heteroscedasticity, and serial correlation in the residuals. Our results suggest that a combination of structural, financial and institutional factors seem to exert a significant effect on Sukuk markets. Indeed, larger economic size, higher proportion of Muslims in the population, better investment profile, and lower corruption are associated with larger Sukuk markets, while higher interest rate spread is negatively related to Sukuk market development.

*JEL Classifications:* C33, G10, G21, G29

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# **The Determinants of Sukuk Market Development**

## **1. Introduction**

In recent years, the global bond market has witnessed a growing niche which has been of much interest to Muslim investors. Parallel to conventional bonds, Islamic bonds have emerged not only as attractive investment opportunities, but also as sources of raising corporate and sovereign funds. These Islamic bonds are broadly referred to as Sukuk.

The Sukuk market has become, in the last few years, the fastest growing sector of the Islamic financial services industry, overtaking the Islamic banking segment on growth basis. Indeed, the global Sukuk outstanding issuances has grown at a CAGR of 20.8% over the period 2008-2013 with the industry total size has surpassed the USD 300 billion mark by the end of 2014<sup>3</sup>. Malaysia has largely been the center of the Sukuk market, accounting for nearly one-third of all Sukuk issuances in 2014. The Sukuk market has been driven by a huge interest among various sovereign, quasi-sovereign and corporate issuers in tapping the Sukuk market to raise funds, especially in the wake of the global financial crisis. In 2014 alone, several new countries made their debut in the global primary Sukuk market: the United Kingdom, Hong Kong, Luxembourg, Senegal, and South Africa. Other countries remain in the pipeline for debut Sukuk issuances in the near future, including Kenya, Kyrgyzstan, Jordan, Mauritania, Morocco, Malta, and Tunisia among others.

Despite the surge in Sukuk issuances and the growing size of the market, there is a very limited academic literature on Sukuk when compared to the cornucopia of literature on

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<sup>3</sup> Islamic Finance Services Board Stability report, 2015.

conventional bonds. For instance, Nathif and Thomas (2004) assessed different aspects of Sukuk, including how to identify eligible assets, set up Special Purpose Vehicles, and the challenges and opportunities of Sukuk markets. Jaffer (2011) discussed the global importance of innovative Sukuk. Daruwalla and Siddiqui (2010) analyzed the intrinsic value of *Sukuk* and how it applies in the sovereign Sukuk market.

To the author's knowledge, there has not yet been any empirical study on the determinants of Sukuk market development. This study is aimed at filling the gap in the literature by empirically analyzing the structural, institutional, developmental, and macroeconomic determinants of Sukuk market development using a sample of 13 countries over the period 2001-2013.

The rest of the paper is structured as follows: Section 2 explains the concept of Sukuk and how it differs from conventional bonds. Section 3 presents the literature review. Section 4 describes our data and variables, while Section 5 explains our methodology. Section 6 presents some descriptive statistics on Sukuk. Section 7 discusses the empirical results, and we conclude in Section 8.

## **2. Sukuk**

### **2.1 Definition**

The Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI)<sup>4</sup> defines Sukuk as follows: *“Investment Sukuk are certificates of equal value representing undivided shares in ownership of tangible assets, usufruct and services or (in the*

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<sup>4</sup> AAOIFI is a non-profit organization which prepares auditing, governance and Shariah standards for companies interested in pursuing Shariah compliance.

*ownership of) the assets of particular projects or special investment activity, however, this is true after the receipt of the value of the Sukuk, the closing of the subscription and employment of funds received for the purpose for which the Sukuk were issued”.*<sup>5</sup>

More simply, Sukuk are asset-backed securities which provide ownership in the underlying asset to the holders. The funds are invested by the issuers with a pre-agreed profit sharing rate, and hence avoiding any interest-based transaction throughout the deal. There are several categories of Sukuk, depending on the operational methodology adopted to execute the transaction. A commonly used Sukuk structure is the *Sukuk al-Ijarah*. These Sukuk structures rely either on the performance of an underlying asset or a contractual arrangement with respect to that asset. After the issuance of the Sukuk certificates, the ownership of the underlying asset gets transferred to the Sukuk buyers. The Sukuk issuers then make rental payments to the holders throughout the life of the financing arrangement. There exists a flexibility to tailor the payment profile or the method of calculation to allow for generating profits. Finally, through a purchase undertaking, the ownership of the asset can also be transferred back.

There are a few important considerations about Sukuk for it to be a Sharia compliant security. Firstly, the ownership of the underlying assets of the contract should be transferred to the Sukuk holders. The issuer cannot continue to own the assets once the Sukuk is issued. Secondly, Sukuk must represent assets that are free of any obligations. This implies that the underlying assets cannot represent receivables or debts. Also, in case the earnings of the issuer fall short of the expected returns, there is no permissibility of offering loans to the Sukuk holders. Finally, at the time of the issuance, there cannot be an

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<sup>5</sup> AAOIFI Shariah Standards for Financial Institutions, 2008.

undertaking that permits the issuer to buy back the underlying assets at nominal price. The acceptable repurchase method is a buyback at the market value.

## **2.2 Types of Sukuk**

Safari et al. (2014) have classified Sukuk based on their structure into the following major types:

**1. *Musharakah Sukuk*:** A Musharakah contract is a partnership arrangement between two (or more) parties, whereby each partner contributes to the capital of the partnership in the form of either cash contributions or contributions in kind. The musharakah partners share the profits of the musharaka in pre-agreed proportions and share the losses of the musharaka in proportion to their initial capital investment. Musharakah Sukuk are equity based securities issued for the purpose of financing business activities or establishing a new project. The Sukuk holders assume ownership in the project based on their respective share ownership. Hence the buyers are essentially partners in the project. The profits and losses are then shared as in a Musharakah contract.

**2. *Murabahah Sukuk*:** This is also referred to as “discount” Sukuk. Murabahah is a type of sale transaction where cost of goods as well as the profit on the sale is declared in advance to both parties. The purchase price, selling price and the profit margin are clearly stated at the time of the agreement. In this contract, the holders receive a payoff only at the maturity. In Murabahah Sukuk, the amount returned at the time of expiration is expected to be higher than the principal amount, but is not explicitly specified early on.

**3. *Ijarah Sukuk*:** These are based on “Ijarah” contracts, which refer to Islamic leasing. Lease contracts based on Ijarah financing require transfer of ownership from the lessor to

the lessee. The former is supposed to have the ownership of the underlying asset throughout the lease period. The lessee is only liable for loss to the leased asset due to negligence but not for any other losses, particularly the ones related to the ownership of the asset.

Ijarah Sukuk are based on the principle of Islamic leasing contracts. They can also be termed as “fixed payoff” securities. Here, the payoff share and the growth rate are agreed upon from the inception. The general concept is that the holders receive periodic rental payments for the ownership of the underlying assets, as is the case with the lessor receiving Ijarah payments.

**4. *Mudarabah Sukuk*:** Mudarabah is a contractual relationship between two parties, with one supplying the capital and the other supplying the labor and skill. The latter invests the capital over a pre-determined activity, which grants each party a share of the earnings as determined at the time of the investment. Since the capital is supplied by only one party here, the risk of loss is also borne entirely by it. Mudarabah Sukuk, based on Mudarabah contracts, can be considered as variable payoff instruments. The contract specifies a profit sharing ratio instead of a certain amount. Hence, the returns to the holders are subject to the returns achieved by the issuer. Usually, the payoff ratio is associated with a known benchmark, such as LIBOR.

**5. *Istisna Sukuk*:** In an Istisna sale agreement, a manufacturer is ordered to manufacture a specific good for the purchaser. Like other Islamic finance contracts, the price and the specification of the goods are specified in advance. In case of Istisna Sukuk, the funds are utilized for manufacturing purposes, such as commodities or buildings etc. The payments to the holder are made through installments of a pre-agreed amount. The last payment includes an extra amount based on the market value of the manufactured item.

**6. Salam Sukuk:** Salam contracts are meant to provide funding for projects where payments are made in advance of the transaction. These contracts are widely applicable in the agriculture and mining industries. In these contracts, the financial institution makes an advance payment to purchase assets, which the seller is supposed to supply on a pre-agreed date. For the payment in advance, the contracting parties stipulate a future date for the supply of goods of specified quantity and quality. Salam Sukuk operate with the underlying assets to be purchased based on a Salam agreement. The Sukuk certificates entitle the holders to an ownership interest in the asset and a right to a return in proportion to their investment in the underlying Salam contract.

### **2.3 Sukuk vs. Bonds**

Sukuk and bonds are classified as fixed income securities, and are issued largely for the same set of purposes. However, there are differences in their respective structures and mechanisms. The differences don't appear too prominent in terms of the operational activities. However, the differences explained by Afshar (2013) which are also more important from the Sharia perspective, are tabulated in Appendix I.

Despite the structural difference between Sukuk and conventional bonds, the former are widely referred to as "Islamic bonds". Businesses classify capital raised through Sukuk in their financial statements as non-interest bearing debt.

## **3. Literature Review**

Despite the emergence of Sukuk across different markets globally, there are very limited studies on this subject. Among the notable works is the one by Azmat et al. (2014) who analyzed the difference in the determinants of issuer's choice in the case of conventional

and Islamic bonds. Through a sample of Malaysian Sukuk, they find that a higher long-term debt ratio by firms raises their propensity to issue Islamic debt bonds. Godlewski et al. (2013) examine whether investors react differently to the announcements of Sukuk and conventional bond issues. They show that the stock market reacts negatively to announcements of Sukuk issues, but is neutral to the announcements of conventional bond issues. In another study, Godlewski et al. (2014) observed the market reaction to the firm's stock after their issuance of Sukuk. They witnessed that Ijara Sukuk generally favored a positive stock market reaction. In another study on Sukuk, Van Wijnbergen and Zaheer (2013) worked on identifying the causes that led to the default of four specific Sukuk offerings. They assert that, in most cases, the problems could be traced back to the contractual clauses that made those Sukuk similar to conventional bonds. Wilson (2008) suggested that a sovereign Sukuk pricing benchmark based on GDP growth would be more stable in Saudi Arabia than on conventionally applied interest rates. Jaffer (2011) discussed the global importance of innovative Sukuk. Daruwalla and Siddiqui (2010) analyzed the intrinsic value of Sukuk and how it applies in the sovereign Sukuk market. Finally, Nathif and Thomas (2004) assessed different aspects of Sukuk, including how to identify eligible assets, set up Special Purpose Vehicles, and the challenges and opportunities of *Sukuk* markets. However, to the knowledge of the authors, there has not yet been any empirical study on the determinants of Sukuk market development. Therefore, in what follows, it is worth assessing the literature on the determinants of conventional bond markets.

In their seminal paper, Eichengreen and Luengnaruemitchai (2004) examined the determinants of bond market development for a sample of 41 developing and developed countries over the period 1990-2001, with a focus on Asia. They identify large country



size, strong institutions, less volatile exchange rates, and competitive banking sector as factors fostering the Asian bond market. On the other hand, they find that a strong fiscal balance in the economy leads to a weaker bond market.

Eichengreen et al. (2008) extended the analysis of Eichengreen and Luengnaruemitchai (2004) by using a sample of developing and developed countries, with a focus on Latin America. Their findings suggest that country size and GDP per capita are both positively and significantly related to bond market development. Furthermore, Trade openness is associated with larger bond markets. The authors explain this result by the fact that a developed export industry reflects a developed economy, which is attractive to investors, hence bonds issuance would be well received.

Burger and Warnock (2006) conduct a comprehensive study on 49 local bond markets. They find that better historical inflation performance and strong legal institutions help in the development of bond markets. Another finding suggests that the factors for bond market development are very similar to those that strengthen the banking system. This also explains the reason why most of previous studies have found that banking system plays a major role in the development of bond markets.

Along the same line, Claessens et al. (2007) witnessed that bond markets are positively influenced by the domestic financial system measured by the size of the deposits in the banking system as a ratio of the GDP. Again, the banking system's strength appears to be a proxy for bond market development. Other factors include inflation, fiscal burden, legal origin, and capital account openness, each of which has been addressed in the studies discussed.

Adelegan and Radzewicz-Bak (2009) was the first study to bring focus to corporate debt in Sub-Saharan Africa (SSA). They apply the panel data framework of Eichengreen and Luengnaruemitchai (2004) to analyze the determinants of domestic debt market capitalization for 23 SSA countries from 1990 to 2008. They too found that among the key factors which develop the bond market are the structure of the economy, investment profile, law and order, size of the banking sector and economic development. One unique factor they identify is the savings constraint. According to them, low savings lead to lower financial intermediation by banks, hence affecting the bond market negatively.

More recently, Bhattacharyay (2013) analyzed the determinants of the bond market in Asian economies by examining bond issuances and certain economic factors. The findings suggest that the size of economy, the stage of economic growth, the openness of the economy, the exchange rate variability, the size of the banking system, and interest rate variability as the major determinants of bond market development.

Finally, Mu et al. (2013) carry out a similar investigation on the determinants of bond market in African economies. They find that better institutions and interest rate volatility are associated with larger government bond markets, while small fiscal deficits, high interest rate spreads, exchange rate volatility, and current and capital account openness have negative effects. These findings clearly complement those of Bhattacharyay (2013) and Eichengreen and Luengnaruemitchai (2004) which focused on Asian economies.

Considering the fact that Sukuk are used as an alternate of bonds both by sovereign and corporate issuers, we test the above mentioned factors as potential drivers of the Sukuk market in a diverse set of economies. However, the Sukuk market is comparatively smaller

than that of the conventional bonds and has varying levels of acceptance in different regions in terms of its compliance with the Islamic principles. Therefore, we believe that other factors, such as Sharia governing laws, population of Muslims, or the size of Islamic Banking, may have a role in shaping up the Sukuk market in a particular region. Such factors obviously do not play a prominent role in a conventional bond market.

## **4. Sample and Variables**

### **4.1 The Sample**

We analyze empirically the macroeconomic, historical, structural, legal and financial determinants of Sukuk market development using a panel of 13 countries over the period 2001-2013. To ensure a time series dimension to our data, our sample includes all countries for which we observe at least three annual Sukuk data over the study period<sup>6</sup>. Table 1 presents the list of the countries in our sample, along with their corresponding number of domiciled Sukuk, and some of the geographical trends of Sukuk issuances.

< Insert Table 1 about here >

### **4.2 Description of Variables**

#### ***Sukuk Market Development (Sukuk)***

Our dependent variable is Sukuk market development measured with Sukuk market capitalization as a share of GDP.

#### ***Economic Size (GDP,PPP)***

When the size of the economy is small, there would be no incentives to issue *Sukuk* in the local market because it would not attract multinational corporations and foreign investors.

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<sup>6</sup> As a result, Bangladesh, Bermuda, Cayman Islands, and Luxembourg have been eliminated from our sample.

Small economies are often characterized by significant volatility, illiquidity and issuer concentration amongst other characteristics. Under these conditions, not only small but even relatively large (to the whole market) Sukuk issuance may impact prices given the significant expected increase in trade due to these new Sukuk floating on the market. Thus, small markets tend to be too volatile and this is unattractive for international investors (Eichengreen and Luengnaruemitchai, 2004; Eichengreen et al., 2008). As the financial sector faces large fixed costs, having a small scale is harmful for its development. Thus, a minimum efficient scale is required for the development of a deep, stable and large Sukuk market. We measure Economic size by GDP at Purchasing Power Parity.

#### ***Natural Openness (Open)***

Rajan and Zingales (2003) argue that banks will try to protect their market share from being eroded by financial markets' competition. However, when the economy is exposed to increased foreign competition via international trade, banks may not be able to suppress competing sources of supply. Hence, Sukuk markets may develop faster in more open economies. Natural openness is measured as the ratio of exports to GDP.

#### ***Legal Origin (Legal)***

According to LaPorta et al. (1998), the British common law legal system, which offers stronger protection for private investor rights than the French civil law legal system, should foster the development of Sukuk market. Therefore, we expect a positive relationship between common law and Sukuk market development. We also expect that countries adopting Sharia law should be associated with faster Sukuk market development. We use a dummy variable taken from LaPorta et al. (1998) to capture the legal origin. Sharia law is measured with a dummy variable that is equal to one if the country adopted Sharia law and zero otherwise.

### ***Muslim Population (Muslim)***

We conjecture that, all else being equal, the higher the percentage of Muslims in a country, the higher the demand for Sharia-compliant securities, and hence the faster the development of Sukuk market.

### ***Size of Islamic Banking***

We test for the impact of the size of Islamic banking on the development of Sukuk markets since Islamic Banks serve as dealers and market makers in the Sukuk markets, and are considered as the major investors in Sukuk certificates, which are structured to comply with Islamic investment principles. We measure the size of Islamic banking in a country with the ratio of Islamic banking assets to the country's total banking assets.

### ***Income per Capita (GDPC)***

We posit that higher levels of income per capita should result in higher demand for financing activities, and hence higher need for Sukuk securities. Moreover, less developed countries are often characterized by weak creditor rights, inadequate corporate governance, poor transparency, and volatile investment environments (Eichengreen et al., 2004). We use the GDP per Capita to capture these underdevelopment features.

### ***Institutions***

It is now well established in the empirical literature that developed institutions of governance matter for financial and economic development because they shape the structure of economic incentives in society, facilitate investment in physical and human capital, and contribute to the efficient allocation of resources in the economy (Knack and Keefer, 1995; Mauro, 1995; Hall and Jones, 1999; Easterly and Levine, 2003; Dollar and

Kraay, 2003; Acemoglu et al., 2001). We conjecture that developed institutions of governance should spur the development of Sukuk market.

We measure the quality of institutions using four indexes taken from the International Country Risk Guide (ICRG), namely:

- *Investment Profile (IP)*: is an assessment of factors influencing the risk to investment, which is proxied by a risk rating using the sum of three subcomponents, namely: contract viability/expropriation, profits repatriation, and payment delays.
- *Law and Order (LO)*: is an assessment of the strength and impartiality of the legal system and the popular observance of the law.
- *Control of Corruption (CC)*: is an assessment of corruption within the political system.
- *Bureaucratic Quality (BQ)*: is an assessment of institutional strength and bureaucracy. Higher scores are given to countries where the bureaucracy tends to be autonomous from political pressures and has the power and expertise to govern without brutal changes in policy or interruptions in governmental services.

It is worth noting that a higher value of a given ICRG index is associated with a lower value of the associated risk. For instance, a higher value of the Control of Corruption index means a lower degree of corruption.

### ***Bond Market Development (Bond)***

By channeling savings to long-term borrowers, bond markets play a pivotal role in the efficient functioning of capital markets. Further, bond markets establish the benchmark interest rates for debt securities with different maturities (Thumrongvit et al., 2013). We argue that the development of a viable domestic bond market helps lowering the concentration of market power in the banking sector, ameliorating the infrastructure for the issuing and trading of debt securities, and fostering the issuance of debt securities among potential domestic and international borrowers. The resulting disintermediation of the

domestic financial system should favor the development of Sukuk markets<sup>7</sup>. We measure bond market development with bond market capitalization as a share of GDP.

***Interest rate variability (Intvol)***

When interest rates are variable, investors tend to have little appetite to invest in long-term debt instruments, including *Sukuk* securities. This is due to perceived risk that the purchasing power of long-term debt securities could be eroded when there is high interest rate variability (Bhattacharyay, 2013). We therefore expect a negative relationship between the variability of interest rates and Sukuk market development. Interest rate variability is measured with the standard deviation of interbank rates.

***Level of interest rates (Spread)***

Sukuk securities compete with conventional banks and bonds in providing external finance. Investors see the opportunity cost of investing in Sukuk securities as equal to the current prevailing interest rate. The lower the interest rate, the lower the forgone opportunity cost, and hence Sukuk issuances should be stimulated. The level of interest rates is measured by the interest rate spread (lending rates minus borrowing rates).

***Exchange rate volatility (FXvol)***

Stable exchange rates display lower exchange rate risk for foreign investors. Therefore, a stable exchange rate regime should be more conducive to Sukuk market development. The higher the volatility of a country's exchange rate, the lower is the development of its Sukuk market. Exchange rate volatility is measured by the standard deviation of the log of exchange rates.

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<sup>7</sup> We are thankful to an anonymous referee for suggesting this link between bond markets and Sukuk market development.

Table 2 illustrates our variables, their definitions, and their data sources.

< Insert Table 2 about here >

## 5. Methodology

In this section, we describe our model and the estimation method we use to investigate the determinants of Sukuk market development in a dynamic panel setting. Our dynamic panel model of Sukuk market development can be written as follows:

$$y_{i,t} = \alpha y_{i,t-1} + \beta' x_{i,t} + \mu_i + \varepsilon_{i,t} \quad (1)$$

Where  $y_{i,t}$  is the Sukuk market capitalization over GDP,  $x_{i,t}$  is the vector of the explanatory variables described above;  $\mu_i$  is an unobserved country-specific effect;  $\varepsilon_{i,t}$  is the error term;  $i$  holds for the country ( $i=1, \dots, N$ ); and  $t$  stands for the period ( $t=1, \dots, T$ ).

The lagged dependent variable,  $y_{i,t-1}$ , is included to allow for the partial adjustment of Sukuk market development to its long-run equilibrium value. Thus, all the beta coefficients represent short-run effects. The long-run effects can be obtained by dividing each beta coefficient by (1-alpha).

We can rewrite model (1) as follows:

$$y_{i,t} = \alpha y_{i,t-1} + \beta' x_{i,t} + \varepsilon_{i,t}^* \quad (2)$$

Where  $\varepsilon_{i,t}^* = \mu_i + \varepsilon_{i,t}$



Since  $y_{i,t-1}$  is, by construction, correlated with  $\mu_i$ <sup>8</sup>,  $y_{i,t-1}$  will also be correlated with the new error term,  $\varepsilon_{i,t}^*$ . Hence, the lagged dependent variable is endogenous. Furthermore, using the Modified Wald test and the Breush-Pagan test, we conclude respectively for the presence of panel heteroscedasticity and autocorrelation in the error series. Therefore, OLS estimates will yield biased and inconsistent estimates of the parameters' standard errors<sup>9</sup>.

To tackle the heteroscedasticity and autocorrelation problems as well as the endogeneity problem of the lagged dependent variable, we use the Generalized Method of Moments (GMM) estimation technique, which employs orthogonality moment conditions to obtain valid instruments. The main intuition behind GMM is to establish the population moment conditions and then to use their sample analogs to compute parameter estimates. More specifically, we estimate model (2) using the System GMM estimator proposed by Blundell and Bond (1998) which combines, within a system, the regression in levels and the regression in differences. For the regression in levels, the instruments used are the lagged differences of the endogenous and exogenous variables. The instruments for the regression in differences are lagged levels of the endogenous and exogenous variables previous or equal to (t-2).

It is worth mentioning that the validity of the System GMM estimator rests on two key assumptions: the error terms are not serially correlated and the instruments used in the regression in levels and in differences are valid. To test both hypotheses, we run two

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<sup>8</sup> To see this, simply lag equation (2) by one period.

<sup>9</sup> Furthermore, even standard panel data estimators with fixed or random effects are not appropriate for estimating models like equation (2). For example, fixed effects panel data regressions yield biased estimates since correlation between the transformed lagged dependent variable and the transformed error term is still there (Baltagi, 2001).

specification tests proposed by Arellano and Bond (1991) and Arellano and Bover (1995). The first tests the null hypothesis that the differenced error term,  $\Delta\varepsilon_{i,t}$ , has no second order serial autocorrelation<sup>10</sup>. The non-rejection of the null hypothesis provides support to our model. The second is a Hansen test of over-identifying restrictions, which tests the overall validity of the instruments. Our model specification is valid if we cannot reject the null hypothesis of over-identifying restrictions.

Blundell and Bond (1998) show that the standard errors of the two-step System GMM estimator are biased downward in finite samples. We tackle this problem in two ways. First, we employ a lower number of instruments than the number of sample countries in order to mitigate the over-fitting problem of the endogenous variable and improve the efficiency of the two-step estimator (Beck and Levine, 2004; Roodman, 2009). Second, we employ the Windmeijer (2005) correction of the estimated variance<sup>11</sup>.

## 6. Descriptive Statistics

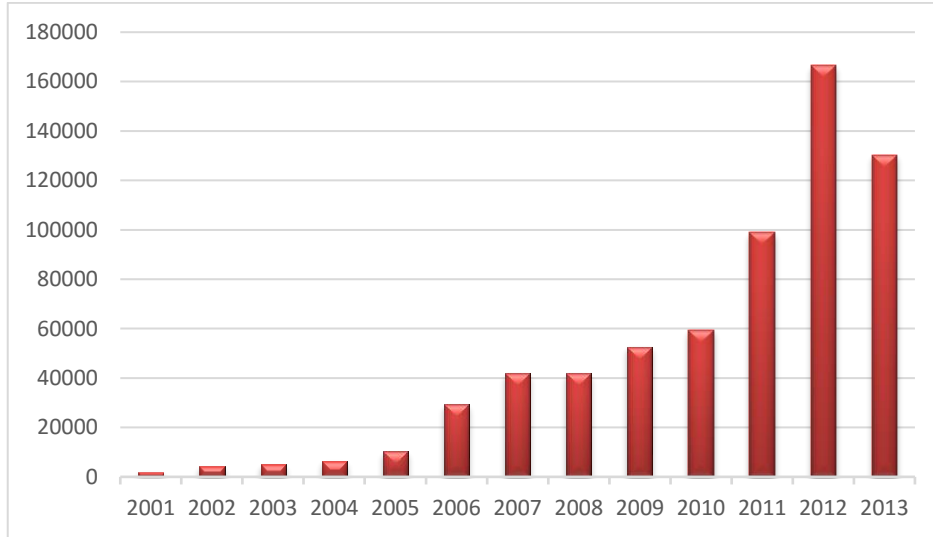
We performed a brief analysis of the trends in the global Sukuk markets to see how the product has grown over the period under study. Figure 1 below shows the growing trend by depicting the gradual rise in the total Sukuk issued by all the countries combined. It is interesting to see that the Sukuk market also got affected negatively during the years of the

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<sup>10</sup> However, Arellano and Bond (1991) show that when the error term,  $\varepsilon_{i,t}$ , is not serially correlated, then the differenced error term,  $\Delta\varepsilon_{i,t}$ , should display first order autocorrelation but no second order autocorrelation.

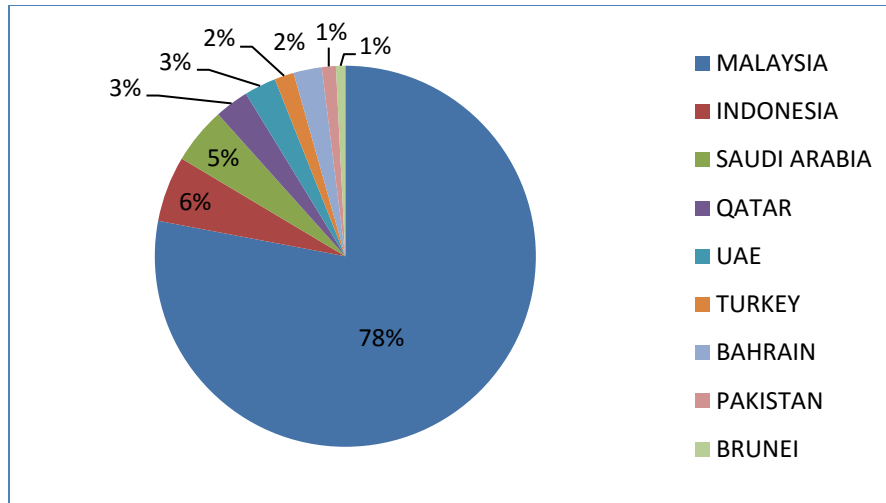
<sup>11</sup> Using Monte-Carlo simulations, Windmeijer (2005) confirms that the corrected variance closely approximates the finite sample variance of the two-step System GMM estimator.

financial crisis, particularly in 2008. Year 2012 saw a huge jump but the trend does not appear to have sustained.



**Figure 1: Total *Sukuk* Issuance (in Millions of USD)**

A geographical breakdown of the Sukuk issued between 2001-2013 shows the dominance of the Malaysian market in this regard. However, it is worthy to note that Malaysia has been issuing Sukuk far before any other country and is naturally a mature market. Figure 2 below excludes countries with a less than 1% share.



**Figure 2: Global *Sukuk* Issuance by country over the period 2001-2013**

Table 3 displays the descriptive statistics for our main variables. We notice that our dependent variable, *Sukuk*, shows reasonable level of dispersion. This implies the *Sukuk* markets in separate countries show a range of capitalizations, with maximum as high as 96% of the GDP. Economic size variable itself has a high standard deviation, showing a distinct range of economies, in terms of size, chosen for the study. Most of the other variables show very low levels of standard deviation. The exceptions are natural openness, income per capita, and size of the banking system. Table 4 presents the correlation matrix of the independent variables.

< Insert Table 3 and Table 4 about here >

## 7. Results

Table 5 shows the results of the regression equations estimated using the System GMM procedure for our sample of 13 emerging countries over the period 2001-2013. As

discussed above, we rely on the Hansen (1982) test for the overall validity of our instruments, and on the Arellano and Bond (1991) test for the presence of second order autocorrelation in the differenced residuals. We notice that, for all specifications, the test of Hansen (1982) cannot reject, at the 1% level, the null hypothesis of the overall validity of the instruments used. Moreover, the Arellano and Bond (1991) test cannot reject, at the 1% level, the null hypothesis of absence of autocorrelation of the second order in the residuals. Further, we notice that the coefficients of the lagged dependent variable are positive and highly significant (p-value less than 1%) in all specifications. These results provide support for our use of dynamic panel models to assess the determinants of Sukuk market development.

The first two columns of Table 5 show the effect of countries' structural characteristics on Sukuk market development. The coefficients of economic size are positive and significant at the 1% level, whatever the specification. Therefore, countries with smaller economic size tend to have underdeveloped Sukuk markets since they would lack the scale efficiencies needed for liquid and deep markets. This suggests that economies of scale effects exist in the development of Sukuk markets, including developing the required legal framework for trading and issuing and incurring the fixed costs of creating clearing and settlement systems. We also note that the coefficients of openness are not significantly different from zero at the 5% significance level in all specifications, which implies that openness does not appear to play a major role in the development of Sukuk markets. Similarly, English common-law tradition, Sharia law, and size of Islamic Banking have no significant impact on Sukuk market development. As expected, the coefficient of Muslim population is positive and statistically significant at the 1% level. This implies that the

higher the percentage of Muslims in a country, the higher the demand for Sharia-compliant securities, and hence the faster the development of Sukuk market.

Column 3 of Table 5 presents the results of the impact of the developmental stage of the economy on Sukuk market development. This is proxied by GDP per capita as a summary measure of development, investment profile as measure of the safety of the investment environment, and the rule of law index. The results show that per capita GDP is not significantly related to Sukuk market development. Interestingly, the coefficient of Investment profile is expectedly positive and statistically significant at the 5% level (p-value of 0.011). In other words, the safer the investment environment in a country, the faster the development of Sukuk market. Surprisingly, rule of law enter with a negative and significant, at the 1% level, parameter estimate. This counterintuitive result is consistent with earlier findings by Adelegan and Radzewick-Bak (2009) on bond markets.

Column 4 of Table 5 displays the results of the effects of regulation and governance of the financial sector on the development of domestic Sukuk markets. We notice that the coefficient of corruption is positive and significant at the 1% significance level. This implies that the lower the level of corruption in the political system, the larger the Sukuk market. Furthermore, the coefficient of bureaucratic quality is negative, but not statistically different from zero. We also notice that the development of bond markets is not significantly related to the development of Sukuk markets at conventional levels.

Column 5 of Table 5 considers macroeconomic factors. The results show that while the volatility of interest rates is not statistically significant, their level, as measured by the spread between lending and borrowing rates, is negatively and significantly related to

Sukuk market development. This implies that higher inflation, typically associated with macroeconomic instability and sometimes with government defaults, hinders the development of Sukuk markets. Finally, the coefficient on the volatility of changes in exchange rates is positive but insignificant at conventional levels.

Finally, column 6 considers the entire range of hypotheses. As expected, the size of the economy, the investment profile, and the control of corruption remain positively and significantly related to Sukuk market development. However, Muslim population is no longer significantly related to the development of Sukuk markets. Furthermore, the coefficients of Law and Order and interest rate spread remain negative but not statistically different from zero.

All in all, the results suggests that no single class of variables is fully responsible of the development of Sukuk markets, rather the evidence shows that a confluence of many factors drives the level of development of *Sukuk* markets.

< Insert Table 5 about here >

### **Robustness Checks**

To investigate the robustness of our results, we conducted two robustness checks. First, we tested for the possibility that Malaysia could be driving the results, since approximately 78% of the Sukuk in our sample were issued in Malaysia. Hence, we dropped Malaysia from our analysis. The results, reported in Table 6, are qualitatively and quantitatively similar to those presented in Table 5.

< Insert Table 6 about here >

Second, we estimated our regressions using the Prais-Winstone procedure as an alternative to the GMM method. It is worth noting that the Prais-Winstone 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. Overall, the results that appear in Table 7 are similar to those presented in Table 5. We note, though, that the coefficient of Muslim population is still positive but no longer significant at the 5% level. Furthermore, the coefficient of bond market development is unexpectedly negative but not statistically different from zero at conventional levels. Finally, interest rate spread is no longer significantly related to Sukuk market development. These results, however, must be interpreted with caution since the Prais-Winstone technique fails to correct for the endogeneity of the lagged dependent variable.

< Insert Table 7 about here >

## **8. Conclusion**

In recent years, the markets have witnessed the emergence and rapid growth of Sukuk certificates. These instruments appear to provide governments and corporations with an alternative source of financing that is compliant with Sharia principles. To our knowledge, however, no single study has shed the light on the drivers of Sukuk market development. This study aimed at filling this gap in the literature. More specifically, the objective of this paper is to empirically investigate the structural, financial, developmental, institutional, and macroeconomic determinants of Sukuk market development for a sample of 13 Sukuk-issuing countries over the period 2001-2013. We employ the system GMM procedure to tackle the problems of endogeneity of lagged dependent variable as well as the



heteroscedasticity and serial correlation in the residuals. Our results suggest that a combination of structural, financial and institutional factors seem to exert a significant effect on Sukuk securities markets. Indeed, larger economic size, higher proportion of Muslims in the population, better investment profile, and lower corruption are associated with larger Sukuk markets, while higher interest rate spread is negatively related to Sukuk market development. Overall, our findings are intuitive and generally consistent with earlier studies on bond market development (Adelegan and Radzewicz, 2009; Eichengreen and Luengnaruemitchai, 2004; Mu et al., 2013).

A set of important policy implications would seem to flow from these results. Countries seeking to promote their Sukuk markets should strive to develop their economies and follow stable macroeconomic policies to make it attractive for investors to hold Sukuk securities. Moreover, they should foster the development of their institutions of governance by fighting corruption in the political system and improving the local investment environment to ensure viability of contracts, ease of profit repatriation, minimization of payment delays, and effective enforcement of rule of law.

**Appendix I:** Differences between Sukuk and conventional bonds.

<b>Sukuk</b>	<b>Conventional Bonds</b>
<b>The contract is that of a seller-buyer relationship</b>	Borrower-lender contract
<b> Holders claim ownership of underlying assets, which can be tangible or intangible</b>	Assets do not necessarily exist. Holders are simply lenders
<b>Obligor sells assets to the Special Purpose Vehicles (SPVs), which deals with the Sukuk buyers</b>	SPVs are not needed
<b>Returns originate from the underlying asset</b>	Returns are predetermined
<b>Income stream is a return on the investment in the asset e.g. rent</b>	Income is primarily the interest
<b>Returns can vary, depending on the market value of the underlying assets</b>	Returns do not vary with the performance of the issuer
<b>There exists a possibility of capital appreciation, leading to higher returns than the yield</b>	Returns are fixed. They can be lower than the yield (as in a default), but not higher.
<b>Profits are shared</b>	No profit sharing
<b>Sukuk have certain risks like Shariah risk<sup>12</sup> and legal risk<sup>13</sup></b>	No Shariah issues
<b>Interest rate risk and purchasing power risk are absent</b>	Bonds have risks related to interest rate, including purchasing power risk

Source: Afshar (2013)

<sup>12</sup> Shariah risk is the risk of violation of any Shariah provision in the transaction.

<sup>13</sup> Legal risk, in case of Sukuk, arises due to the possibility of a conflict between Shariah guidelines and regulations in the country of Sukuk issuance.

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**Table 1: Sukuk Geographical Statistics**

The table below lists the countries chosen for the study. It also shows the number of Sukuk issued over the period 2001-2013. Further statistics show the nature of Sukuk issuance in each market, including the proportion of Sovereign Sukuk and Domestic Sukuk, the number Sukuk Defaults and the average years of maturity of Sukuk issued in the respective market over the study period.

<b>Country</b>	<b>No. of Sukuk Issuances</b>	<b>Sovereign Issuances</b>	<b>Domestic Issuances</b>	<b>Defaults</b>	<b>Average Maturity (Years)</b>
Bahrain	203	92.1%	68.5%	3	1.11
Brunei	92	100.0%	100.0%	0	0.37
Gambia	68	100.0%	98.5%	0	0.21
Indonesia	269	67.7%	97.0%	2	3.21
Kuwait	6	0.0%	66.7%	0	7.50
Malaysia	8,764	4.6%	99.7%	124	3.10
Pakistan	57	26.3%	98.2%	0	4.63
Qatar	15	86.7%	66.7%	0	5.47
Saudi Arabia	32	0.0%	93.8%	0	10.32
Singapore	17	17.6%	94.1%	0	4.59
Turkey	13	53.8%	38.5%	0	4.61
United Arab Emirates	23	17.4%	17.4%	0	5.13
Yemen	5	100.0%	100.0%	0	2.80

**Table 2: Definition of Variables**

<b>Variable</b>	<b>Label</b>	<b>Measure</b>	<b>Source</b>
Sukuk Market Development	Sukuk	Sukuk market capitalization to GDP	<i>Bloomberg</i>
Economic Size	GDP,PPP	GDP at Purchasing Power Parity	<i>World Development Indicators (WDI)</i>
Natural Openness	Open	Exports to GDP	<i>WDI</i>
Legal Origin	Legal	Dummy variable equals to 1 if legal origin is Common Law and 0 otherwise	<i>LaPorta et al. (1998)</i>
Sharia Law	Sharia	Dummy variable equals 1 is the country adopted Sharia law and 0 otherwise	<i>Factbook, CIA</i>
Muslim Population	Muslim	Percentage of Muslims in the country	<i>Alesina et al. (2003)</i>
Size of Islamic Banking	Isbank	Ratio of Islamic banking assets to total banking assets	<i>Islamic Financial Services Board (IFSB)</i>
Income per capita	GDPC	GDP per capita at PPP	<i>WDI</i>
Institutions	IP LO CC BQ	Investment Profile Law and Order Control of Corruption Bureaucratic Quality	<i>International Country Risk Guide (ICRG)</i>
Bond Market Development	BOND	Bond market capitalization as a share of GDP	<i>Global Financial Development Database (GFDD)</i>
Size of Banking system	Credit	Credit to private sector by commercial banks to GDP	<i>WDI</i>
Interest rate variability	Intvol	Standard deviation of monthly interbank rates	<i>International Financial Statistics (IFS)</i>
Level of interest rates	Spread	Lending rates minus borrowing rates	<i>IFS</i>
Exchange rate volatility	FXvol	Standard deviation of the log of exchange rates	<i>IFS</i>



**Table 3: Descriptive Statistics**

This table reports the descriptive statistics of our main variables for the sample of 13 countries between 2001 and 2013.

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Sukuk	169	2.11	10.97	0.00	96.03
GDP, PPP	167	452.31	499.30	1.62	2389
Open	159	65.46	49.55	12.38	230.27
Legal	169	0.46	0.50	0.00	1.00
Sharia	169	0.15	0.36	0.00	1.00
Muslim	169	0.29	0.22	0.00	0.66
Isbank	143	0.23	0.14	0.06	0.51
GDPC	167	39.87	36.17	1.24	136.72
IP	169	0.76	0.18	0.18	1.00
LO	169	0.69	0.17	0.33	1.00
CC	169	0.41	0.12	0.17	0.75
BQ	169	0.58	0.19	0.25	1.00
Bond	169	19.61	27.74	0.00	108.32
Intvol	143	2.15	1.49	0.25	5.36
Spread	122	5.63	3.31	1.64	17.58
FXvol	169	0.09	0.09	0.00	0.28

**Table 4: Correlation matrix**

This table shows the correlation coefficients for the explanatory variables used in our main regression models. The sample period is 2001-2013. The definitions of our variables appear in Table 2.

<b>Variable</b>	<b>GDP, PPP</b>	<b>Open</b>	<b>Legal</b>	<b>Sharia</b>	<b>Isbank</b>	<b>Muslim</b>	<b>GDPC</b>	<b>IP</b>	<b>LO</b>	<b>CC</b>	<b>BQ</b>	<b>Bond</b>	<b>Intvol</b>	<b>Spread</b>	<b>FXvol</b>	
<b>GDP, PPP</b>	1.00															
<b>Open</b>	-0.21	1.00														
<b>Legal</b>	-0.35	0.33	1.00													
<b>Sharia</b>	-0.21	0.01	0.23	1.00												
<b>Isbank</b>	-0.63	0.43	-0.06	0.57	1.00											
<b>Muslim</b>	-0.01	0.70	0.63	0.10	-0.11	1.00										
<b>GDPC</b>	-0.34	0.38	-0.26	0.26	0.62	-0.44	1.00									
<b>IP</b>	-0.39	0.64	0.23	0.31	0.52	-0.43	-0.59	1.00								
<b>LO</b>	-0.48	0.52	0.25	0.28	0.54	-0.37	-0.73	-0.77	1.00							
<b>CC</b>	-0.01	0.75	0.19	-0.03	0.27	-0.37	-0.28	-0.56	-0.43	1.00						
<b>BQ</b>	-0.08	0.81	0.50	0.38	0.65	-0.73	-0.28	-0.51	-0.42	0.61	1.00					
<b>Bond</b>	0.25	0.49	0.37	-0.22	-0.23	0.69	-0.23	-0.01	-0.09	0.27	-0.54	1.00				
<b>Intvol</b>	-0.62	-0.60	-0.35	-0.41	-0.71	-0.46	-0.73	-0.65	-0.79	0.38	-0.60	-0.49	1.00			
<b>Spread</b>	-0.17	-0.33	0.31	-0.08	-0.48	-0.39	-0.43	-0.23	-0.17	0.08	-0.23	-0.50	0.34	1.00		
<b>FXvol</b>	-0.61	-0.30	-0.23	-0.10	-0.39	-0.29	-0.70	-0.53	-0.80	0.11	-0.19	-0.30	0.80	0.24	1.00	

**Table 5: Multivariate Analysis**

This table shows the results of the regressions estimated with the GMM in system procedure of Blundell and Bond (1998) for our sample of 13 countries for the period 2001-2013. The dependent variable is Sukuk market development. The definitions of our 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.

<b>Explanatory Variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>
Lag of Dependent Variable	0.285*** (0.000)	0.314*** (0.000)	0.520*** (0.000)	0.682*** (0.000)	0.738*** (0.000)	0.398*** (0.000)
GDP, PPP (billions of \$)	0.031*** (0.000)	0.024*** (0.000)				0.021*** (0.000)
Exports to GDP	-0.002 (0.933)					-0.169 (0.949)
English Legal Origin	5.694 (0.337)					-32.052 (0.496)
Sharia Law	10.581 (0.600)					-0.036 (0.999)
Muslim Population		35.778*** (0.003)				111.312 (0.529)
Size of Islamic Banking		11.640 (0.582)				-66.549 (0.360)
GDP per Capita, PPP (thousands of \$)			-0.069 (0.843)			-0.061 (0.588)
Investment Profile			107.8 ** (0.011)			13.684*** (0.005)
Law and Order			-163.9*** (0.006)			-14.174 (0.389)
Corruption				99.10*** (0.001)		14.911*** (0.000)
Bureaucratic Quality				-57.115 (0.118)		-73.689 (0.426)
Bond Market Development				0.227 (0.220)		-0.332 (0.325)
Interest rate variability					2.516 (0.379)	-22.120 (0.379)
Interest rate spread					-0.429** (0.035)	-0.509 (0.107)
Exchange rate volatility					2.098 (0.962)	250.238 (0.462)
Constant	-9.629 (0.204)	-18.715*** (0.000)	-23.839*** (0.000)	-12.237 (0.350)	-2.047 (0.566)	63.178 (0.465)
Hansen Test	0.770	0.625	0.873	0.877	0.980	1.000
AR2 Test	0.326	0.327	0.327	0.340	0.317	0.301
Number of Observations	144	154	120	156	104	79

**Table 6: Results without Malaysia**

This table shows the results of the regressions estimated with the GMM in system procedure of Blundell and Bond (1998) for our sample of emerging countries for the period 2001-2013. We dropped Malaysia from the analysis. The dependent variable is Sukuk market development. The definitions of our 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.

<b>Explanatory Variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>
Lag of Dependent Variable	0.310*** (0.000)	0.351*** (0.000)	0.518*** (0.000)	0.625*** (0.000)	0.732*** (0.000)	0.309*** (0.000)
GDP, PPP (billions of \$)	0.027*** (0.002)	0.023*** (0.000)				0.032*** (0.000)
Exports to GDP	0.023 (0.580)					-0.445 (0.588)
English Legal Origin	5.550 (0.672)					138.444 (0.271)
Sharia Law	32.778 (0.496)					366.014 (0.311)
Muslim Population		40.965** (0.036)				-682.503 (0.208)
Size of Islamic Banking		15.428 (0.530)				243.919 (0.377)
GDP per Capita, PPP (thousands of \$)			-0.132 (0.704)			0.074 (0.912)
Investment Profile			107.53*** (0.006)			5.090 (0.701)
Law and Order			-153.87*** (0.009)			-33.432 (0.444)
Corruption				132.18*** (0.000)		13.445** (0.033)
Bureaucratic Quality				-62.052* (0.066)		-7.446 (0.921)
Bond Market Development				0.395** (0.017)		0.325 (0.771)
Interest rate variability					1.287 (0.323)	168.370 (0.315)
Interest rate spread					-0.429** (0.039)	-0.643** (0.049)
Exchange rate volatility					22.031 (0.339)	-29.553 (0.276)
Constant	-19.266 (0.162)	-24.627*** (0.010)	30.745 (0.413)	-24.569* (0.073)	-0.481 (0.762)	-105.218 (0.432)
Hansen Test	0.699	0.756	0.642	0.992	1.000	1.000
AR2 Test	0.329	0.326	0.305	0.362	0.317	0.306
Number of Observations	132	142	108	144	92	67

**Table 7: Prais-Winston Regressions**

This table shows the results of the regressions estimated with the Prais-Winston procedure for our sample of emerging countries for the period 2001-2013. The dependent variable is Sukuk market development. The definitions of our 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. \*\*\*, \*\*, \* refer to the 1, 5 and 10% levels of significance respectively.

<b>Explanatory Variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>
Lag of Dependent Variable	0.454*** (0.000)	0.447*** (0.000)	0.719*** (0.000)	0.692*** (0.000)	0.658*** (0.000)	0.420*** (0.000)
GDP, PPP (billions of \$)	0.018*** (0.000)	0.019*** (0.000)				0.022** (0.015)
Exports to GDP	-0.012 (0.784)					0.077 (0.684)
English Legal Origin	6.641 (0.240)					-5.981 (0.847)
Sharia Law	-4.252 (0.577)					-0.200 (0.996)
Muslim Population		6.827 (0.641)				27.767 (0.693)
Size of Islamic Banking		16.213 (0.415)				-24.555 (0.668)
GDP per Capita, PPP (thousands of \$)			-0.100 (0.138)			-0.052 (0.836)
Investment Profile			21.923** (0.026)			15.543 (0.290)
Law and Order			-22.626* (0.053)			-11.048 (0.730)
Corruption				35.905*** (0.000)		15.002 (0.369)
Bureaucratic Quality				-28.503* (0.051)		-35.295 (0.485)
Bond Market Development				-0.005 (0.917)		-0.196 (0.454)
Interest rate variability					2.766 (0.463)	-9.207 (0.406)
Interest rate spread					-0.619 (0.131)	-0.822 (0.561)
Exchange rate volatility					20.562 (0.776)	93.149 (0.681)
Constant	-10.339** (0.033)	-16.056** (0.040)	6.874 (0.315)	7.694 (0.288)	-2.844 (0.679)	20.064 (0.743)
Adjusted-R2	0.693	0.693	0.621	0.642	0.636	0.739
Number of Observations	144	130	154	156	114	79