How does financial risk affect sukuk market development? Empirical evidence from ARDL approach

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Abstract

Despite the great attention that sukuk received from Islamic financial systems, the academic literature on the determinants of sukuk market development (SMD) is both new and very limited. To our knowledge, this study is the first to empirically investigate the challenges to SMD in Saudi Arabia. The data were collected from in-depth Saudi Central Bank and ICRG databases over the period 2012Q1-2021Q1. Using ARDL approach, we analyse how the financial risk components affect the development of Saudi sukuk market. Our findings indicate that exchange rate stability, foreign debt stability and debt service stability seem to be the main drivers of the development of SMD in Saudi Arabia, while international liquidity stability and current account stability do not appear to play a major role. As policy implications, Saudi policymakers should strengthen financial stability to ensure a well-developed sukuk market.

1. Introduction

Theoretical and empirical studies on the determinants of stock and bond markets development in both developed and emerging countries have been multiplied during the last decades showing their considerable importance in the process of economic growth and development (Eichengreen and Luengnaruemitchai 2004, 2006; Burger and Warnock 2006; Claessens et al., 2006, 2007; Ben Naceur et al., 2007; Yartey 2008; Eichengreen et al., 2006, 2008, Bae 2012; Bhattacharyay 2013, Mu et al., 2013; Laeven 2014; Felman et al., 2014; Gray et al., 2014; Suarez 2014; Burger et al., 2015; Ayala et al., 2016; Smaoui and Khawaja. 2017; Eichengreen et al., 2006, 2007; Ben Naceur et al., 2007; Yartey 2008; Claessens et al., 2006, 2007; Bae 2012; Bhattacharyay 2013, Mu et al., 2013; Laeven 2014; Felman et al., 2014; Gray et al., 2014; Suarez 2014; Burger et al., 2015; Ayala et al., 2016; Smaoui and Khawaja. 2017; Smaoui et al., 2017; Teplova and Sokolova 2018; Al-Raeai et al., 2018; Huong, 2020; Alnagar et al., 2021; Boukhatem 2021b, etc.). However, the growing importance of Sukuk around the world has recently involved an increasing interest in the research on sukuk markets due to the roles they played in contemporary Islamic economies.

According to the Accounting and Auditing Organization for Islamic Financial Institution (AAOIFI) sukuk are defined as “certificates of equal value representing undivided shares in ownership of tangible asset, usufructs and services, assets of particular projects of special investment activity”. On another side, sukuk (Shariah compliant bonds) are typically considered as Islamic asset-based rather than asset-backed securities, and consequently must be related to a particular asset, service or project for a set of time (Godlewski et al., 2011). They are considered as relevant long-term sources of financing government and infrastructure potential projects with underlying assets such as real estate (Tariq and Dar 2007; Jobst et al., 2008; Kusuma and Silva 2014). They play the role of intermediaries between lenders and borrowers by channelling the savings to useful and Islamic law compliant investments. They might play an important role in financing large companies and sovereign entities (Alam et al., 2013; Godlewski et al., 2013), and in strengthening financial stability (Taoual 2016).

Sukuk is one of the fastest growing sectors of the Islamic finance industry and the flagship instrument of the Islamic capital market. Since the 2008 financial crisis, having already played an influential role in propelling sukuk to prominence prompting investors to view it as a viable financing route, the global sukuk market has grown considerably. In 2019, its contribution to the global Islamic finance industry is approaching 20% (Alpen Capital and Alpen Asset Advisors, 2021). In addition to the good financing conditions that have supported the market, growth has been largely driven by increased issuance of sukuk for both financing governments’ fiscal deficits and managing liquidity in various jurisdictions. The sukuk sector has also demonstrated its ability to innovate quickly and create new opportunities through developing Basel III-compliant sukuk, Fintech sukuk, and block-chain sukuk. Markets have also made great progress towards achieving sustainable...
development over the past few years, aligning investment policies and practices in favour of those achieving social development while promoting environment protection. Green sukuk and socially responsible sukuk were developed in line with these values, whilst sukuk SME financing has also gained popularity in recent years.

In addition to the diverse benefits of providing resources, local-currency denominated sukuk can be used in strengthening financial stability by mitigating maturity and currency mismatches widely viewed as a main source of financial vulnerability. This is a situation of ‘original sin’ in which domestic currency cannot be used to borrow abroad or to borrow long term, even domestically. In such a situation, domestic investments have either a currency mismatch or a maturity mismatch. Projects generating Rials will be financed with US dollars, and long-term projects will be financed with short-term loans, generating then a situation of financial fragility.

In spite of the growing size of global sukuk issuances which rose 4.4 % YoY during the first nine months of 2020, the academic literature focusing on the determinants of sukuk market development (SMD), compared with that on bond markets, still under-researched. Although the literature addresses the overall determinants of country-level SMD, on closer inspection the main focus is really macroeconomic and institutional stability ones. The financial risk (stability) factors are almost completely overlooked. So, despite their rapid growth and increasing public attention, sukuk markets are still limited and lack empirical validations. This led to confusion among industry players and may well be the most important reason, among others, behind the higher premium required in buying sukuk comparatively to conventional bonds (Raei and Cakir, 2007). According to Tariq and Dar (2007), the most popular risks are market risk, credit risk, liquidity risk, currency risk, and the compliance risk (also known as Shariah compliance risk). However, in addition to the aforementioned risks, the development of sukuk markets still facing several challenges, such as ‘Buy and Hold’ effect, in addition to the country’s capacity to fulfil its financial obligations (Jobst et al., 2008; Godlewski et al., 2011).

Saudi Arabia has been at the forefront of the development of the Islamic financial services industry. Internationally, it is considered among the major leading countries in issuing sukuk alongside Malaysia and Indonesia, thereby contributing in keeping intact the tremendously growth trajectory of global sukuk issuance. Saudi Arabia becomes the single largest issuer and the most active country in the GCC region (Islamic Financial Services Board 2019). Besides, by the end of 2018, the banking sector takes the lion’s share with 46.5% of the Islamic financial system assets, followed by the equity market with 39.7%. Sukuk outstanding occupies the third place with only 11.2% (Islamic Research and Training Institute, 2020). Between 2017 and 2019, GCC region takes around 24% of domestic sukuk issuances, while Saudi Arabia leading the region with almost 80% followed by Bahrain with 10%. Interestingly, Saudi sukuk market has become key economic contributor in recent years. During 2019, Saudi Arabia financed 50% of its fiscal deficit through local-currency denominated sukuk, and that instead of the high dependency on bank financing and the declining the contribution proportion of debt instruments (sukuk and bonds) in financing compared to stock markets (Alnagar et al., 2021).

What is more, one of the first pillar's objectives of the financial leadership program (2019–2021) launched by the capital market authority (CMA) aiming to achieve the Saudi vision 2030, consists at developing breadth and deep sukuk markets, in order to maintain the leading position of the Saudi capital market at the regional level, and to become one of the leading financial markets in the world improving asset allocation and economy’s resources diversification. This program involves also shifting from an oil-based economy heavily dependent in oil prices fluctuations, to a more diversified economy where financial sector plays a primordial role providing more alternatives for projects financing, therefore increasing the local investment rates. The proper identification of the risk associated with sukuk issuance may lead to fair and accurate pricing compatible to the levels of associated risks.

Though, this paper has not found any study on the role of financial risk components in SMD in general, and in Saudi Arabia particularly. It aims to fill this gap by proposing an empirical validation on the possible effects of financial risk components in the development of the Saudi sukuk market with monthly frequency data. The use of international country risk guide (ICRG) database, basically considered as the only risk rating agency compiling political, economic, financial, and composite risk ratings for more than 90 countries, constitutes in itself a genuine contribution.

The subsequent part of this study is presented as follows. Section 2 briefly reviews the literature. Section 3 details data and methodology. Section 4 presents results and discussions. Section 5 concludes the paper.

2. Literature review

Sukuk markets represent the first structure having truly contributed to global convergence between conventional and Islamic finance. Due to the relative similarity between conventional fixed-income and sukuk securities, many investors turn into sukuk. This trend is fostered by the adequate techniques in risk management, mobilising then untapped funds and enabling the satisfaction of a greater assortment of investment appetites. According to Tariq and Dar (2007), sukuk represent an essential instrument in deepening financial markets, heightening their discipline and increasing their financial stability. They are considered as indispensable vehicles for mobilizing resources in both public and private sectors. Finally, it has been well documented, through a partial equilibrium approach, that a well-developed sukuk market plays an important role in hedging interest rate and inflation risks effectively and, thereby improves investor welfare (Boukhatem 2021a). This paragraph will be reserved to review the main studies on the determinants of SMD, and mainly on its relationship with financial risk compounds.

Schroeck (2005) defined risk as uncertainty or variation around some average value. It is usually measured as a standard deviation or variation of outcomes. According to Khan and Ahmed (2001), risks can be divided into financial and business risks. While business risk is highly related to firm’s business, financial risk arises from eventual possible losses in financial markets due to movements in financial variables. When outlining sukuk models, we have to consider the different risks that are incorporated in their structure. These risks include both systemic market risk component and idiosyncratic component (Najeeb 2013; Boukhatem and Djelesi 2000). Sukuk are basically highly exposed to market and financial risks. Generally, the studies on sukuk deal rather with the sukuk-associated risks, and the adequate financial instruments allow avoiding these risks, than with risks as determinant of (under)development of sukuk markets (Wilson 2004, 2008; Smolarski et al., 2006; Tariq and Dar 2007; Al-Sayed 2013; Al-Raeai et al., 2019; Balli et al., 2021).

Besides, the first study devoted to the determinants of SMD is that of Ahmad et al. (2012). Using vector autoregressive (VAR) modelling with aggregate-level data, the authors investigated the impact of

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1 Green Sukuk are Shariah-compliant instruments used in funding environmentally beneficial projects. They are used in financing renewable energy production, sustainable agriculture, waste management, natural resource management, the construction of energy-efficient buildings, and other efforts helping the environment or mitigating climate change problems.

2 This effect is an investment strategy whereby sukuk holders held sukuk assets to maturity (Zukhibri 2015).

3 Market risk is defined as the risk on instruments traded in well-defined markets. Two categories of market risks are identified: systematic risk and idiosyncratic (firm specific) risk. Market risk is composed of foreign exchange risk, interest rate risk, equity price risk, and commodity risk. The idiosyncratic risk is specific to Islamic financing and includes factors such as: operational risk, credit risk, institutional risk, and Shariah compliance risk (Heffernan, 2003).
market.

in the same context, Said and Grassa (2013) examined the possible interconnections between macroeconomic, financial, legal, and institutional factors and SMD on the one hand, and between financial crises and sukuk on the other hand. The main results proved that selected macroeconomic and institutional variables (GDP per capita, economic size, trade openness, and regulatory quality) have significant positive effects on the development of sukuk market, while financial crisis seems to be negatively associated to SMD.

More recently, Smaoui and Khawaja (2017) attempt to empirically investigate the structural, financial, developmental, institutional, and macroeconomic determinants of SMD. It is important to note that the financial factors used by the authors are limited to those measuring the size of banking sector and stock and bond markets. Applying the system general method of moment (system-GMM) for a panel of 13 Sukuk-issuing countries over the period 2001–2013, the authors show that a mixture of structural, institutional, and financial factors appear to exert a significant effect on SMD.

Al-Raeai et al. (2019) develop a conceptual model to investigate the macroeconomic determinants of SMD in Gulf Cooperation Council (GCC) countries. The authors show the growing role the macroeconomic factors played in promoting sukuk markets in GCC economies. They have to follow stable macroeconomic policies to make their markets more attractive for investors.

Later, Al-Raeai et al. (2019) empirically examined the influence of macroeconomic factors and political risk on SMD in selected GCC countries using pooled ordinary least square (POLS) and generalized least squares (GLS) estimation techniques over the period 2001–2016. The findings reveal that exchange rates, trade openness and the size of the banking sector are the main factors driving SMD, while stock market capitalization and saving rates do not show significant contribution in developing sukuk markets of GCC countries. Finally, the most important result is the positive association between the political risk and SMD.

Using content analysis approach, Aman et al. (2019) theoretically investigated the determining factors likely to contribute to SMD. Especially, the authors focused on the dynamics of foreign capital inflows, macroeconomic and financial factors with respect to SMD. They conclude towards an inconclusive association between these factors and SMD.

Covering the most Sukuk issuers’ countries, the study of Mirza and Sultana (2020) examined the determinants of SMD over the period 2003–2012. The results showed that many variables drive the development of sukuk market. Economic factors such as GDP per capita, economic size, trade openness, and percentage of Muslims have a positive impact on the growth of Sukuk market. Likewise, countries with higher regulatory quality ranking and those adopting a shariah legal origin or mixed common law - shariah law legal origin, have more developed sukuk markets. However, financial crisis has a major negative effect on the growth of sukuk market.

In line with the financial sector development plans within 2030 vision objectives, Aininagar et al. (2021) identify the level of impact of five challenges on Saudi SMD. Except for the legal framework, the results showed statistically significant effects of the other four challenges, namely secondary market activation, shariah governance, completed yield curve, and credit rating on developing sukuk market in Saudi Arabia.

Finally, Banyarabah et al. (2021) analysed the impact of macroeconomic and institutional stability on global SMD while controlling to the effects of population. The authors used GMM techniques on annual data over the period 2002–2017. The main results show that GDP per-capita and the rule of law index exert positive and significant impacts on the development of sukuk market, while inflation and exchange rates do not affect SMD. These results also confirm the previous findings, whereby inflation remains controllable at a certain level for economic development.

The above-mentioned literature has investigated macroeconomic and institutional determinants of SMD. However, this literature does not give a lot of consideration to financial factors, and mainly to financial risk components. Moreover, it reveals research gaps about the empirical studies on the financial determinants of SMD, mainly in GCC countries heavily dependent on oil revenues making them more vulnerable to oil prices fluctuations, increasing their budget deficits. Since sukuk have advantages compared to bonds4, GCC governments should diversify their economies by developing sukuk markets as alternative sources of financing long-term infrastructure projects and other productive investments, in order to reduce their dependence on oil exports and bank financing, improving thereby their financial soundness.

3. Data and methodology

3.1. Data definition and measure

As measure for sukuk market size, this study employs the total amount of sukuk assets outstanding issued in domestic market (SAR billions)5 over the period 2012Q1–2021Q1. The beginning of the sample period is restricted by the availability of sukuk data in Saudi Arabia. Besides, we consider five different variables measuring the financial components of risk as presented by the international country risk guide (ICRG), basically considered as the only risk rating agency compiling political, economic, financial, and composite risk ratings for more than 90 countries.

According to ICRG methodology, the objective of the financial risk rating (FRR) measure consists at providing a means to assess a country's ability to pay its financial obligations. Also, the FRR can be considered as a country's likelihood of having a financial crisis in the coming years. Basically, it had five subcomponents as follows:

a. Current account as a percentage of exports in goods and services (max 15 points);

b. Exchange rate stability (max 10 points).

c. Foreign debt as a percentage of GDP (max 10 points);

d. Foreign debt service as a percentage of export in goods and services (max 10 points);

e. Net liquidity as months of import cover (max 5 points);

Table 1 presents the variables definitions and their statistical sources as well as their acronyms. However, a summarizing detailed guide of the different variables used in measuring financial risk components are available in the ICRG guide to data variables document (https://www.prsgroup.com/wp-content/uploads/2014/08/icrgmethodology.pdf).

3.2. Model and empirical methodology

The objective of this study consists at examining short and long-run impacts of financial risk components on SMD using the ARDL modeling, firstly developed by Pesaran and Shin (1999) and Pesaran et al. (2001). The ARDL approach is applicable in different contexts, thereby providing some desirable advantages over the other conventional cointegration approaches such as Engle and Granger (1987), and Johansen and Juselius (1990) cointegration approaches which require the same order of integration for all the variables. Also, this approach is suitable with small size samples and permits a combination of different stationary variables (I(0) and I(1)). Finally, the endogeneity issue is less severe with uncorrelated residuals (Baharumshah et al., 2009).

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4 More details on distinguishing characteristics of sukuk as compared with bonds can be found in Kusuma and Silva (2014), table p. 32.

5 We take the natural logarithm of sukuk outstanding.
Table 1. Variables and data sources.

| Variable                                | Acronym | Description                              | Source                  |
|-----------------------------------------|---------|------------------------------------------|-------------------------|
| Sukuk market development                | Sukuk   | The total amount of sukuk assets         | Central Bank (SAMA)     |
| size                                    | size    | outstanding issued in domestic market    |                         |
| Financial risk measures                 |         |                                          |                         |
| Exchange Rate Stability                 | ERS     | Risk Points for Exchange Rate            | ICRG database           |
| Stability                               |         | Stability as % change                    |                         |
| Foreign Debt Stability                  | FDS     | Risk Points for Foreign Debt             |                         |
| Debt Service Stability                  | DSS     | Risk Points for Debt Service             |                         |
| Current Account Stability               | CAS     | Risk Points for Current Account           |                         |
| International Liquidity Stability       | ILS     | Risk Points for International Liquidity  |                         |
|                                         |         | as Months of Import Cover                |                         |

Source: SAMA and ICRG.

The baseline model related to the impacts of the financial risk components on SMD can be represented by the following equation:

\[ \text{SU} \tau = \alpha + \theta_i \text{ERS}_i + \theta_2 \text{FDS}_i + \theta_3 \text{DSS}_i + \theta_1 \text{CAS}_i + \theta_4 \text{ILS}_i + \epsilon_i \]

(1)

where SUK, ERS, FDS, DSS, CAS, and ILS are explained previously in Table 1.

To investigate the long-run relationships among the variables relating to Eq. (1), the ARDL bounds test for the cointegration can be specified as follows:

\[ \Delta \text{SU} \tau_i = \alpha_0 + \alpha_1 \Delta \text{SU} \tau_{i-1} + \alpha_2 \Delta \text{ERS}_{i-1} + \alpha_3 \Delta \text{FDS}_{i-1} + \alpha_4 \Delta \text{DSS}_{i-1} + \alpha_5 \Delta \text{CAS}_{i-1} + \alpha_6 \Delta \text{ILS}_{i-1} + \epsilon_i \]

(2)

where \( \epsilon_i \) is the error term that is white noise, and \( \Delta \) represents the difference operator. Conclusions about the long-run cointegration relationships of the variables are made using the bound test F-statistic value.

After confirming the existence of cointegrating relationships among the variables, the second step includes estimating the long-run coefficients of the ARDL model through the following equation:

\[ \Delta \text{SU} \tau_i = \sum_{i}^{p} \theta_j \Delta \text{SU} \tau_{i-j} + \sum_{j}^{q} \theta_j \Delta \text{ERS}_{i-j} + \sum_{k}^{q} \theta_j \Delta \text{FDS}_{i-k} + \sum_{l}^{q} \theta_j \Delta \text{DSS}_{i-l} + \sum_{m}^{q} \theta_j \Delta \text{CAS}_{i-m} + \sum_{n}^{q} \theta_j \Delta \text{ILS}_{i-n} + \epsilon_i \]

(3)

Finally, short-run dynamics can be estimated through the error correction model (ECM):

\[ \Delta \text{SU} \tau_i = \sum_{i}^{p} \theta_j \Delta \text{SU} \tau_{i-j} + \sum_{j}^{q} \theta_j \Delta \text{ERS}_{i-j} + \sum_{k}^{q} \theta_j \Delta \text{FDS}_{i-k} + \sum_{l}^{q} \theta_j \Delta \text{DSS}_{i-l} + \sum_{m}^{q} \theta_j \Delta \text{CAS}_{i-m} + \sum_{n}^{q} \theta_j \Delta \text{ILS}_{i-n} + \psi \text{ECT}_{t-1} + \epsilon_i \]

(4)

4. Results and discussion

4.1. Unit root tests

Before testing for cointegration, we apply the augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) unit root tests to determine the stationarity of variables and their order of integration. Table 2 illustrates the results of these tests that consistently record that all series are nonstationary at level, and stationary at first difference and are consequently integrated of order one I(1), except for debt service stability index (DSS) which is stationary at level I(0)).

Given these mixed results of variables order integration, I(0) and I(1), our study fulfils the preconditions for applying the ARDL model which is more appropriate than the Johansen cointegration model, to investigate the impact of financial risk indicators on the domestic SMD in Saudi Arabia.

4.2. Bounds testing for cointegration

Before applying the cointegration test, we run the VAR Model to select the optimum lag order. Based on Akaike information Criterion (AIC), the optimal lag suggested is 1 (Table 3).

Table 4 presents the results of the bounds test of the ARDL specification. Accordingly, the calculated F-statistics is higher than the upper critical bound value at 1% significance level, thereby suggesting the existence of cointegration between the variables SUK, ERS, FDS, DSS, CAS, and ILS. Henceforth, we estimate the long-run relationship between

Note: The Schwarz information criterion was utilized to select the optimal lag, while the Newey-West Bartlett kernel was utilized to determine the bandwidths for PP.

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6 When the F-statistics is greater than the upper critical bound I(1), there exist a long-run cointegration relationship and when it is less than the lower bound critical value I(0), no cointegration is presumed. Finally, if the F-statistic value is between the upper and the lower critical value bounds, then the decision is inconclusive.

7 Note that the F-test could lead to spurious results in the presence of I(2) series (Odhambo 2009).
sukuk outstanding and the financial risk factors relying on the Akaike Information Criterion (AIC).

The short- and long-run estimations are displayed in Table 5. All the short-run coefficients are significant at 1% and 5% significance levels, except for the variables CAS and ILS. Our results make evidence of significant positive impacts of exchange rate stability (ERS) index on the outstanding amount of sukuk. This result seems to be in line with economic theory stipulating that exchange rates are considered as one of the key factors affecting bond (sukuk) markets (Boukhatem et al., 2021, Boukhatem, 2009-2021). In fact, Exchange rate volatility (ERV) is seen as key factors affecting bond (sukuk) markets (Boukhatem et al., 2021, Khawaja (2017) in the context of sukuk issuing countries. and Smaoui and Khawaja (2017). The higher the stability of a country’s exchange rate, the higher is the development of its sukuk market. This confirms the strategic choice of the Saudi Central Bank exchange rate policy pegging the Saudi riyal to the US dollar, thereby supporting financial and economic development.

Foreign debt stability (FDS) and debt service stability (DSS) indexes positively affect the SMD. In fact, theoretically, foreign debt is needed in closing three deficits: the current account deficit, the budget deficit and the saving investment gap. Moreover, foreign debt is very vulnerable to ERV (Krugman et al., 2015). The higher the ERV, the lower the FDS, and hence sukuk issuances are hampered. Besides, local-currency sukuk markets (LCSMs) represent alternative sources of financing for a country, thereby reducing its dependency on foreign debt. LCSMs are also important for benchmarking corporate sukuk markets, another source of corporate long-term financing. FDS constitutes an important factor encouraging government to issue more sukuk to finance deficits. These results are in line with those of Min (1998) and Sachs (1985) in the context of bonds.

Finally, international liquidity stability (ILS) and current account stability (CAS) indexes do not appear to play a major role in the development of Saudi sukuk market. This result is in line with that of Feyen et al. (2015), in the context of bond issuance in emerging and developing economies. Although the effects are insignificant, our results corroborate with the findings of Bhattacharyay (2013) and Eichengreen and Lueng-narumitchai (2006) focusing on Asian bond markets, and Smaoui and Khawaja (2017) in the context of sukuk issuing countries.

In terms of significance, the results of long-run estimates appear to corroborate those of short-run ones. The signs assigned to the coefficients of the variables are quite different. However, these results are non-surprising and corroborate those of Felman et al. (2014), and Smaoui and Khawaja (2017).

The coefficient of the error correction term \(\text{ECT}_{t-1}\) is highly significant at 1% level, and carry an inverse sign, thus reinforcing the existence of a cointegrating relationship among the underlying variables. The error correction coefficient is equal to \(-0.164\) suggesting that on average 16.4% of the deviation from the equilibrium level will be corrected in the next quarter. Therefore, it takes approximately about six quarters to restore the long-run equilibrium. Nevertheless, the fact that the ECT coefficient is between 0 and 1 confirms that the long-run relationship holds.

### 4.3 Diagnostic tests

Lastly, various diagnostic tests of the selected model are illustrated in Table 6: Breusch-Pagan test for heteroscedasticity, Breusch-Godfrey (serial autocorrelation LM test), Jarque-Bera normality test, and Ramsey RESET test for functional form specification. The results show that the model passes the diagnostic checks, revealing that the residuals are independent, homoscedastic, normally distributed and non-functionally misspecified. Alternatively, both CUSUM and CUSUM squared plots respectively confirm the stability of the ARDL estimated model at 5% significance level since CUSMUS lines are within the boundaries (Figures 1 and 2 below).
Sukuk constitute valuable instruments of Islamic financial systems for at least three reasons. First, they allow channelling resources to finance adequate economic projects. Then, they allow matching assets (long-term investments) and liabilities (long-term loans) of Islamic financial institutions. Second, they represent an opportunity for small investors to get involved in Islamic finance and make profits. In this way, they allow for a wide transfer of wealth in the society rather than concentrating it in the hands of a few wealthy individuals or groups in the society (Usmani, 2008). With the further development of secondary market, sukuk can help Islamic financial institutions manage liquidity problems.

This study extends the academic literature related to sukuk market development (SMD) in many ways. In our acknowledgement, this is the first study analysing the impacts of financial risk components on SMD in Saudi Arabia using an ARDL modelling. In addition, we use statistics from the original ICRG database, basically considered as the only risk rating agency compiling all types of risk ratings. Our analysis shows two main findings. Exchange rate stability, foreign debt stability, and debt service stability have significant impacts on sukuk outstanding. In contrast, international liquidity stability and current account stability do not affect the development of sukuk market.

The policy implications will be based on the findings of this research on the role of financial risk components on SMD in Saudi Arabia. Policy makers should design new policies in managing financial risk aspects of sukuk in order to provide more stability to the financial environment to make it attractive for investors to hold sukuk securities.

Additionally, other measures can help improving SMD reducing thereby its risks. Standardization of sukuk issuance, collaboration among governmental institutions and Islamic regulatory organizations, development of sukuk secondary market, diversification of sukuk issues, and more active intervention for Shariah boards at all stages of sukuk issuance and trading; are among other outcomes allowing to mitigate the different forms of financial risks.

Besides, the literature on sukuk market is still limited, compared to Islamic banking one, especially in Saudi Arabia. So, increasing SMD literature plays a key role in decision making process. Finally, future research consists at knowing how these same financial risk components affect the different sukuk market compartments (sovereign, quasi-sovereign, corporate, financial institutions Fls).

5. Conclusion

Table 6. Diagnostic tests.

| Specification                        | F-statistics | P. Value |
|--------------------------------------|--------------|----------|
| Breusch-Pagan (Heteroscedasticity)   | 1.727        | 0.128    |
| Breusch-Godfrey (Serial Correlation LM test) | 1.457        | 0.250    |
| Jarque-Bera (Normality)              | 2.179        | 0.336    |
| Ramsey Reset Test                    | 0.069        | 0.794    |

Declarations

Author contribution statement

Jamel Boukhatem: Conceived and designed the experiments;Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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