Capital market and economic growth in Malaysia: the role of *ṣukūk* and other sub-components

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Abstract

Purpose – The purpose of this paper is to explore the effects of the capital market on economic growth by considering the role of *ṣukūk* (Islamic investment certificates) and other capital market sub-components in Malaysia between 1998 and 2018.

Design/methodology/approach – The empirical investigation is based on the autoregressive distributed lag (ARDL) cointegration bounds test.

Findings – The results reveal the prevalence of a long-run equilibrium relationship between capital market variables and economic growth. As expected, bond market components (*ṣukūk* and conventional bonds) have a positive, albeit insignificant influence on economic growth. In contrast, in the long-term, stock market development – regardless of the indicator used on economic growth – is shown to have a significant and positive effect. The study suggests that stock market sub-components affect Malaysia's economic growth the most.

Research limitations/implications – The primary limitation of this study is that only corporate *ṣukūk* were considered, while government *ṣukūk* were excluded from the estimation due to a lack of requisite information, resources and data.

Practical implications – A strategic framework should be established, especially in pricing efficiencies. Furthermore, there is a need to create more awareness on the benefits of *ṣukūk* investment among conventional bond investors, including retail investors. Thus, there will be more players in the *ṣukūk* market, and this will help to improve market liquidity.

Originality/value – Apart from conventional capital market sub-components, this study takes into account *ṣukūk* as a sub-component in the capital market on economic growth using the ARDL framework. Also, this study particularly concentrates on the world's largest *ṣukūk* issuer, Malaysia, rather than focusing on other *ṣukūk*-issuing countries.

Keywords ARDL, Capital market, Economic growth, Malaysia, *Ṣukūk*

Paper type Research paper

Introduction

Linkages between the banking sector and economic growth have been researched extensively. Research on the capital market also questions its relevance to economic growth.

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The majority of studies examining growth involve the two main financial development components, namely, stock markets and banks, while research on the contribution of bond markets is relatively small (Thumrongvit *et al.*, 2013). There is also a lack of studies that consider the impact of *ṣukūk* (Islamic investment certificates), as a part of the capital market sub-components, on economic growth.

Changes in the landscape and pattern of capital markets have brought some innovations in financial market products. Hence, more sub-components in the capital market, including Sharīʿah-compliant products such as *ṣukūk* and Islamic warrants, have been introduced. Such scenarios can change the overall demand, leading to a shift in the demand and supply of capital market products.

In general, capital market debt instruments can be divided into conventional bonds and *ṣukūk*. Both debt instruments are quite similar in structure, but *ṣukūk* make it compulsory for sovereigns and corporations to raise funds according to the principles of Sharīʿah (Islamic law) (Godlewski *et al.*, 2013). Among the Sharīʿah principles, asset ownership is an important feature that distinguishes clearly between bonds and *ṣukūk*. *Ṣukūk* are asset-based securities where the value is backed by underlying assets, and the *ṣukūk* holders own parts of the underlying assets. Conversely, bonds are pure debt obligations where the value of the certificate depends on the issuer's creditworthiness (Alam *et al.*, 2013; Godlewski *et al.*, 2013). As such, *ṣukūk* are often seen as being more secure and attractive to a broad range of investors who intend to diversify their investment portfolios.

According to a recent *ṣukūk* report, total global *ṣukūk* issuance has increased substantially since the 2000s, from US$33.22bn in 2001–2005 to US$116.72bn in 2017 (The International Islamic Financial Market, 2018). As at July 2019, total global *ṣukūk* issuance reached US$145.70bn (The International Islamic Financial Market, 2020). Malaysia remains the lead issuing jurisdiction, with a share of 43.67% (US$63.63bn), followed by Saudi Arabia (US$28.48bn or 19.54%) and Indonesia (US$19.42bn or 13.33%) (The International Islamic Financial Market, 2020).

In relation to that, Figure 1 displays the new issues of stock, *ṣukūk* and corporate bonds in Malaysia over the period 2000–2019. The issuance of new conventional bonds each year was relatively larger than the issuance of new stock. Between 2000 and 2008, the issues of *ṣukūk* were substantially greater compared to the new stock issues. However, there was an opposite trend after 2008 onwards where the issues of new *ṣukūk* were lower than the issues of new stock.

This study is motivated by three reasons. First, despite the increasing attention paid to *ṣukūk*, to-date there is insufficient empirical research on the *ṣukūk*-economic growth nexus (Zulkhibri, 2015). Instead of examining capital market development as a single measurement, this study observes the sub-components of the capital market individually. Second, the capital market-economic growth nexus is assessed through the autoregressive distributed lag (ARDL) estimation (Pesaran *et al.*, 2001), which allows for studying the short-run and long-run relationships among a set of variables. Lastly, rather than focusing on a number of *ṣukūk*-issuing countries similar to Echchabi *et al.* (2016) and Smaoui and Nechi (2017), this study focuses on Malaysia. Malaysia has been chosen as the country of study for three significant reasons. First, Malaysia has had remarkable growth in the *ṣukūk* market compared with other *ṣukūk*-issuing countries over the past 30 years, and it has been a reference point for the *ṣukūk* market, especially from the perspective of legal frameworks and tax regimes. Second, the conventional bond and *ṣukūk* markets are larger than the stock markets in capital structure decisions during a specific time period. Third, due to the complexity of

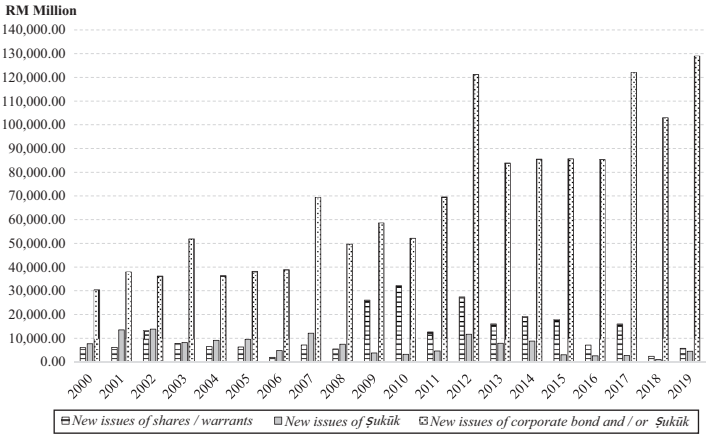

Figure 1.
New issues of stock, *ṣukūk* and corporate bonds in Malaysia (2000–2019)

Source: Bank Negara Malaysia (2019)

different *ṣukūk* structures and the country's fundamentals, quantitative research should be conducted based on an individual country basis, which requires data of a longer time span. Therefore, the main contribution of the present study is that it focuses on the effects of *ṣukūk* and other capital market sub-components on economic growth using the ARDL framework on the world's largest *ṣukūk* issuer, Malaysia.

The remaining parts of the paper are organized in the following way. The next section reviews the relations among various capital market components and economic growth. Further, the data and econometrics models are introduced. The empirical results and robustness checks are discussed next, and the last section provides the conclusion.

Literature review

Conventional finance and economic growth

The financial development-economic growth nexus has been a prime concern for scholars and practitioners over the past few decades. In parallel, many studies have helped to shed considerable light on the link between financial market sub-components (stock and bond markets as well as banking institutions) and economic development. With respect to the increasing number of studies in this area, the literature has evolved around four different possibilities, namely, supply-leading, demand-following, feedback (bi-directional causal) and neutrality (no causality) relationships. According to Patrick (1966, p. 175), the supply-leading relationship is:

> [. . .] the creation of financial institutions and instruments in advance of demand for them to stimulate economic growth. This strategy seeks to make the allocation of capital more efficient and to provide incentives for growth through the financial system.

Alternatively, the demand-following view relates to the real sector development driving the financial sector, implying that causation may run from the real sector to the financial sector. The two-way causation indicates interconnection among financial development and output

growth. Lastly, neutrality shows that there is no causality between financial development and output.

Some early studies including McKinnon (1973) and Shaw (1973) have discussed the nexus between financial development and economic growth. Since then, extensive empirical studies (Cole, 1974; King and Levine, 1993b; De Gregorio and Guidotti, 1995; Demetriades and Hussein, 1996; Levine *et al.*, 2000; Calderón and Liu, 2003) have been conducted in this area. Notably, the results of financial development encouraging economic growth are well documented in most cases (King and Levine, 1993b; De Gregorio and Guidotti, 1995; Calderón and Liu, 2003). Specifically, the studies of Holmström and Tirole (1993) and Boyd and Smith (1998) empirically supported the positive effects of stock markets on growth, by claiming that well-performing stock markets can effectively lower transaction and information costs, thereby promoting economic growth. Similarly, Enisan and Olufisayo (2009) found that output growth is Granger-caused by stock markets in Egypt and South Africa; however, a bi-directional causal relationship does exist in Cote D'Ivoire, Kenya, Morocco and Zimbabwe. Meanwhile, Ngare *et al.* (2014) reported that nations without stock markets have a tendency to develop more slowly than those with stock markets.

Stock markets aside, banking sectors are yet another important factor that affects economic development. A group of studies on economic development have considered the role of stock markets and banking sectors collectively (Levine and Zervos, 1998; Arestis *et al.*, 2001; Beck and Levine, 2004; Fufa and Kim, 2018; Appiah *et al.*, 2020). A recent study by Appiah *et al.* (2020) of three West African countries from 1992 to 2012 highlighted that, in the long-term, capital market development [captured by stock market capitalization to gross domestic product (GDP)] has a significant adverse impact on economic growth. They furthermore found that financial development (measured by domestic credit) also exhibits a negative, albeit insignificant effect Opoku *et al.* (2019) revisited the causal link between financial development and economic growth in 47 African countries from 1980 to 2016. Drawing on the work of Sahay *et al.* (2015), they employed a broad measure of financial development that includes measures of access, depth and efficiency of the financial markets. Specifically, the findings were mostly supportive of the neutrality hypothesis, inferring the absence of a causal link between the two variables. Using various non-linear threshold regression models, Botev *et al.* (2019) generated three interesting findings. First, they cannot confirm that financial development appears to reduce economic development beyond a certain financial development level. Second, the banking and finance markets are complementary; and finally, the response of economic growth to changes in financial development relies heavily on economic development and trade openness. Fufa and Kim (2018) also reported that the mechanism between financial development (stock markets and the banking system) and growth depends on a country's stage of economic development. In a similar context, Levine and Zervos (1998) and Beck and Levine (2004) showed a beneficial effect of both stock markets and the banking sector on growth. In a study that applied cointegration technique on five advanced economies, Arestis *et al.* (2001) discovered that both the stock market and banks stimulate economic growth; however, the effect of the stock market is relatively lower than that of the banking sector. On a similar note, Ake and Ognaligui (2010) also concluded that stock markets do not have significant influence on economic development in Cameroon.

Attention has shifted over time to examining the influence of conventional bonds on output growth (Fink *et al.*, 2003; Thumrongvit *et al.*, 2013; Nordin and Nordin, 2016; Coşkun *et al.*, 2017; Smaoui and Nechi, 2017). Using the aggregate bond market and real income of developed nations, Fink *et al.* (2003) found evidence of a bi-directional causation between two variables in Japan, Italy and Finland. They noted that real growth is highly influenced

by the bonds market development, in line with the supply-leading view in Austria, Germany, Switzerland, the UK and the USA. For the Netherlands and Spain, the evidence is weaker but still not negligible. Another cluster of studies have disaggregated the capital market into the stock market and debt market. Using a sample of 38 countries, Thumrongvit *et al.* (2013) supported the view that the stock market and the banking system lead to economic development. Nevertheless, the role of banking to output growth reduces as domestic bond markets grow. According to Nordin and Nordin (2016), the stock market is found to have a larger impact on output than the debt market. Coşkun *et al.* (2017) explored the aggregated effects of mutual funds, pension funds, corporate bond and stock markets on economic development in Turkey. They observed a cointegrating relation between the capital market and economic development and found causality to be one-way, flowing from the capital market to economic development between 2006 and 2016. The results further indicated that, although the government bond market has an inverse influence, the aggregated effects of other sub-components have a direct influence on economic development.

Islamic finance and economic growth

In spite of the studies on the financial market-growth nexus being plentiful, the relationship between Islamic finance, banking and output growth is comparatively scarce in the literature. Major efforts have been initiated in recent years. For example, Furqani and Mulyany (2009) found that in the short-term, fixed investment Granger causes Islamic bank financing in Malaysia; in the long-term, there is evidence pointing towards a two-way causation among the two variables. In contrast, Manap *et al.* (2012) supported a unidirectional causality from Islamic banking to economic development. Unlike Malaysia, Indonesia appears to have different impacts of Islamic banking development. Abduh and Omar (2012) provided evidence for the presence of short-run and long-run linkages between Islamic banking and economic development in Indonesia. Azouzi and Echchabbi (2013), however, found no correlation between the two variables, either in the short-run or the long-run, in Kuwait over the period 2004–2011. In a recent study related to Islamic banking loans in the Middle East and North Africa (MENA) region, Boukhatem and Ben Moussa (2018) showed that a direct connection is obtained between Islamic banking and output growth. Nevertheless, the direct connection will be reduced under a poor institutional environment.

In addition, the research available on *ṣukūk* and economic development remains limited. Ahmad *et al.* (2012) assessed the influence of macroeconomic determinants on the *ṣukūk* market in Malaysia between 1996 and 2011. They documented that *ṣukūk* Granger causes income, while income Granger causes both business cycle and inflation. Apart from that, Echchabi *et al.* (2016) also revealed quite similar findings. They demonstrated that *ṣukūk* issuance has effects on income and gross capital formation only when all the nations, for instance the Gulf Cooperation Council (GCC) and other nations, are assembled jointly; otherwise, no influence was found for Saudi Arabia and the GCC. Similarly, in a sample of *ṣukūk*-issuing countries from 1995 to 2015, Smaoui and Nechi (2017) revealed strong evidence that the *ṣukūk* market has a significant impact in promoting long-run economic development after considering a range of other factors. In the context of Indonesia, Mitsaliyandito and Arundina (2018) assessed the impact of sovereign bonds and sovereign *ṣukūk* on output growth between 2009 and 2016. The results highlighted that only sovereign *ṣukūk* positively affects economic growth, implying that it is comparatively more productive than conventional sovereign bonds. Lastly, in a recent study from 2008 to 2017, Muharam *et al.* (2019) pointed out that economic growth is found to have no significant effect on the *ṣukūk* market in Malaysia, while, in Indonesia, economic growth exerts a significant

negative long-term effect on the *ṣukūk* market using vector error correction model (VECM). Moreover, Granger-causality results suggested that there is a bi-directional causation between the Islamic stock market and economic growth and between the *ṣukūk* market and economic growth in Indonesia. In Malaysia, a unidirectional causal relationship exists between the *ṣukūk* market and output growth while neutrality is detected between the Islamic stock market and output growth.

All in all, theoretical and empirical analyses of the finance-growth nexus are abundant. Nevertheless, this issue remains important to be further studied especially in relation to *ṣukūk* issuances. Scholars continue to advance this discussion from various aspects such as the stages of the economy as well as financial development and the institutional environment of a country.

Data and methodology

Data

Quarterly data from 1998:1 to 2018:4 in Malaysia were collected. The data for *ṣukūk* (SUKUK), conventional bonds (CB), total conventional bonds and *ṣukūk* (CBS), stock market capitalization (SMC) and stock market turnover value (SMTURN) were extracted from the CEIC database and the Central Bank of Malaysia (Bank Negara Malaysia, BNM), while the remaining data were retrieved from the International Financial Statistics (IFS) database. All the monetary series are denominated in the local currency. The content and details of the variables are presented in Table 1.

Theoretical model

The Solow growth model (Solow, 1956) was extended by Mankiw *et al.* (1992) (Mankiw, Romer, Weil or MRW, henceforth) to study the possible effects of accumulation of human capital. Atje and Jovanovic (1993) and Cooray (2010) suggested a further extension to augment the stock market development in the MRW model with the following process:

$$\mathrm{Ln}\left[\frac{\mathrm{Y}(t)}{\mathrm{L}(t)}\right] = \mathrm{a} + \frac{\theta}{1-\theta-\sigma-\beta}\mathrm{Ln}(s_{\mathrm{K}}) + \frac{\sigma}{1-\theta-\sigma-\beta}\mathrm{Ln}(s_{\mathrm{HC}}) + \frac{\beta}{1-\theta-\sigma-\beta}\mathrm{Ln}(s_{\mathrm{SM}}) - \frac{\theta+\sigma+\beta}{1-\theta-\sigma-\beta}\mathrm{Ln}(n+\mathrm{g}+\delta) + \varepsilon \quad (1)$$

Variables		Unit of measurement
Per capita real GDP	GDPPC	Thousands (MYR)
Ṣukūk	SUKUK	Million (MYR)
Conventional bonds	CB	Million (MYR)
Total conventional bonds and *ṣukūk*	CBS	Million (MYR)
Stock market capitalization	SMC	Billion (MYR)
Total stock market turnover	SMTURN	Million (MYR)
Real savings	SAVR	Million (MYR)
Growth rate of employment	NE	%

Notes: All nominal variables are deflated by the consumer price index (2010 = 100). According to Bank Negara Malaysia (BNM), the terminology of "private debt securities" has changed to "corporate bond and/or *ṣukūk*" since 2016

Table 1.
Variables description

where Ln is the natural logarithms, a is a constant, Y is output, L is labour force; S_K, S_{HC} and S_{SM} represent the shares in output of physical capital, human capital and stock market, n is the population rate, δ refers to the depreciation rate of the capital stock, g denotes the exogenous rate of technological change, and ε is the country-specific shift or shock.

For simplicity, this study assumes that S_{HC} does not vary over time due to mainly the limitations of data (Law and Habibullah, 2006). Therefore, S_{HC} can be treated as a constant term of the regression performed.

Autoregressive distributed lag cointegration bounds test

ARDL methodology offers more merits over conventional cointegration testing. For instance, it permits a combination of I(0) and I(1) time series variables; it is favourable for small sample properties; and the endogeneity issue is less severe if the residuals are uncorrelated (Baharumshah *et al.*, 2009). Following equation (1), the long-run effect is specified as follows:

$$\mathrm{LGDPPC}_t = \theta_1 + \theta_2\mathrm{LSUKUK}_t + \theta_3\mathrm{LCB}_t + \theta_4\mathrm{LSMC}_t + \theta_5\mathrm{LSAVR}_t + \theta_6\mathrm{LNE}_t + \mathrm{e}_t \quad (2)$$

where $t = 1, \ldots, T$, L denotes the natural logarithms, GDPPC stands for real gross domestic product per capita, SUKUK represents *ṣukūk* issuance, CB stands for conventional bonds excluding *ṣukūk*, SMC is stock market capitalization, SAVR is real gross fixed capital formation, NE is the employment growth rate, and e is the error term. δ and g are as defined earlier; both are assumed to be invariant across individual countries; thus $(g + \delta)$ is assumed to be 0.05 (Di Liberto *et al.*, 2011).

According to the Solow model, greater savings level or lower population growth will lead to a higher income level while financial development (stock market development) is expected to have a permanent effect or transitory effect on growth rate (Atje and Jovanovic, 1993). Theoretically, a well-functioning stock market will stimulate savings and reduce transaction costs, leading to an efficient allocation of resources and thereby accelerating economic growth (Cooray, 2010). An argument is made by King and Levine (1993a) in which there are two channels through which the financial system can affect investment decisions on productivity activities and hence boost economic growth. The first is that financial institutions may provide research, as well as evaluate and monitor services, more effectively and at less cost than individuals. Second, these financial institutions perform more consistently and efficiently in mobilizing and providing financing to business activities than individual investors. Meanwhile, the bond market plays a role in making funds available to borrowers in the long run by setting the benchmark interest rate for debt instruments as a signal to save and lend for household decisions and to borrow and invest for business decisions (Thumrongvit *et al.*, 2013). Therefore, all the explanatory variables are expected to exert a positive influence on economic growth, except for the employment rate (LNE).

Alternatively, one can write the unrestricted error correction representations of the ARDL model as follows:

$$\begin{aligned}\Delta\mathrm{LGDPPC}_t = {} & \alpha_0 + \sum_{i=1}^{p-1} \alpha_{1i}\Delta\mathrm{LGDPPC}_{t-i} + \sum_{i=0}^{q-1} \alpha_{2i}\Delta\mathrm{LSUKUK}_{t-i} + \sum_{i=0}^{r-1} \alpha_{3i}\Delta\mathrm{LCB}_{t-i} \\ & + \sum_{i=0}^{s-1} \alpha_{4i}\Delta\mathrm{LSMC}_{t-i} + \sum_{i=0}^{v-1} \alpha_{5i}\Delta\mathrm{LSAVR}_{t-i} + \sum_{i=0}^{w-1} \alpha_{6i}\Delta\mathrm{LNE}_{t-i} + \beta_1\mathrm{LGDPPC}_{t-1} \\ & + \beta_2\mathrm{LSUKUK}_{t-1} + \beta_3\mathrm{LCB}_{t-1} + \beta_4\mathrm{LSMC}_{t-1} + \beta_5\mathrm{LSAVR}_{t-1} + \beta_6\mathrm{LNE}_{t-1} + \mathrm{e}_t\end{aligned} \quad (3)$$

where L is the natural logarithms and Δ represents the difference operator; the long-run parameters are $\theta_2 = -\beta_2/\beta_1$, $\theta_3 = -\beta_3/\beta_1$, $\theta_4 = -\beta_4/\beta_1$, $\theta_5 = -\beta_5/\beta_1$, $\theta_6 = -\beta_6/\beta_1$ and e is the white noise residuals.

Results and discussion

Panel A of Table 2 provides the summary statistics. The average real GDP per capita (GDPPC) is RM15,882, ranging from the lowest of RM985 to the highest of RM20,718 during the sample period. The average new issues of conventional bonds (CB) are nearly 8 times higher than the new issues of *ṣukūk* (SUKUK). As the table shows, the capital market sub-components (SUKUK, CB, SMC and SMTURN) exhibit considerable variations as revealed by their standard deviations over the 21-year period. Meanwhile, the correlation matrix as presented in the same Table (Panel B) signifies that both the conventional bonds and stock market variables are positively linked with real GDP per capita. On top of this, there is little correlation among the explanatory variables, except for real savings (LSAVR) and stock market variables. More importantly, LSAVR and stock market capitalization (LSMC) have a strong correlation of 0.9652, which leads to unreliable and unstable parameter estimates and hence LSAVR is dropped from the model.

It is important to verify the integration order of the series although the ARDL cointegration bounds test enables a combination of I(0) and I(1) data series. Nevertheless, the *F*-test could lead to spurious results in the presence of I(2) series (Ouattara, 2004; Odhiambo, 2009). Table 3 provides the results for the unit root tests of augmented Dickey–Fuller, ADF (Dickey and Fuller, 1979, 1981), Phillips–Perron, PP (Phillips and Perron, 1988) and KPSS (Kwiatkowski *et al.*, 1992) on the variables in level and difference forms. The three unit root tests consistently record that all the series are integrated of either one or zero; thus, all the variables are not I(2).

Table 4 presents the bounds test of the ARDL specification. The calculated *F*-statistic values (Models 1 and 2) are relatively higher than the upper bound critical values obtained from Narayan (2005), indicating that there is a cointegration between LGDPPC, LSUKUK, LCB, LSMC (or LSMTURN) and LNE. Thus, this cointegrating relation ARDL bounds test for cointegration is also accordant with Nordin and Nordin (2016).

To highlight the possible effects of the capital market, real income per capita (LGDPPC) is first regressed on conventional bonds (LCB), *ṣukūk* (LSUKUK) and each stock market indicator. Table 5 shows the results for the long-run and short-run estimations. All the long-

	GDPPC	SUKUK	CB	SMC	SMTURN	SAVR	NE
Panel A: Summary statistics							
Mean	15.8822	1655.8240	13932.1500	3137.5140	82200.6100	44824.6900	0.0566
Maximum	20.7184	6487.1000	44574.6300	5797.9800	165672.2000	75670.9000	0.1074
Minimum	9.8517	0.0000	455.8000	705.5900	13985.4000	19233.8900	0.0128
Std. Dev.	3.0666	1632.5220	9360.3540	1529.7730	43299.3700	17371.4500	0.0156
n	83	83	83	83	83	83	83
Panel B: Correlation matrix							
	LGDPPC	*LSUKUK*	*LCB*	*LSMC*	*LSMTURN*	*LSAVR*	*LNE*
LGDPPC	1.0000	−0.0171	0.7655	0.9182	0.7936	0.9186	0.0289
LSUKUK	−0.0171	1.0000	0.0260	−0.0534	−0.1369	−0.0735	−0.0309
LCB	0.7655	0.0260	1.0000	0.7887	0.6846	0.7635	0.1282
LSMC	0.9182	−0.0534	0.7887	1.0000	0.8883	0.9652	0.1198
LSMTURN	0.7936	−0.1369	0.6846	0.8883	1.0000	0.7913	0.1356
LSAVR	0.9186	−0.0735	0.7635	0.9652	0.7913	1.0000	0.0899
LNE	0.0289	−0.0309	0.1282	0.1198	0.1356	0.0899	1.0000

Table 2.
Summary statistics and correlation matrix

Variables	ADF		PP		KPSS	
	I	T and I	I	T and I	I	T and I
Level						
LGDPPC	−2.0320	−1.0676	−1.2342	−2.5237	1.0621***	0.2759***
LSUKUK	−3.3424**	−6.6957***	−6.8546***	−6.8690***	0.2065	0.1678**
LCB	−3.1932**	−9.8455***	−4.9680***	−9.8171***	1.2030***	0.1142
LSMTURN	−0.9983	−5.3453***	−2.5323	−5.4150***	1.1247***	0.0800
LSMC	−0.8496	−5.1434***	−1.0700	−3.6315**	1.1341***	0.0677
LNE	−12.3243***	−12.3730***	−12.3787***	−12.4378***	0.2159	0.0579
First difference						
LGDPPC	−3.1262**	−6.4841***	−10.4108***	−12.2708***	0.2799	0.2193***
LSUKUK	−8.7744***	−8.9361***	−26.8103***	−32.0502***	0.3441	0.5000***
LCB	−7.6961***	−7.8676***	−45.2568***	−50.0393***	0.1138	0.0978
LSMTURN	−5.8839***	−5.8406***	−12.1052***	−12.0325***	0.0374	0.0365
LSMC	−6.0980***	−6.0956***	−7.7446***	−7.7194***	0.0386	0.0322
LNE	−5.7761***	−5.7320***	−42.7473***	−42.5763***	0.2305	0.1955**

Table 3.
Unit root tests

Notes: *** and ** are 1 and 5% significance levels, respectively. I and T and I represent intercept and trend and intercept, respectively. The optimal lag length (k) is selected using Akaike Information Criteria (AIC) for ADF test; for PP and KPSS tests, Newey–West procedure is used to specify the bandwidth

Model		Calculated *F*-statistic			Critical bound values 1%	5%	10%
1	LGDPPC = f(LS*UKUK*, LCB, LSMC, LNE)	5.9223***	*k* = 4	*I(0)*	3.6870	2.7250	2.3130
2	LGDPPC = f(LS*UKUK*, LCB, LSMTURN, LNE)	11.7946***		*I(1)*	4.8420	3.7180	3.2280

Table 4.
The bounds test for cointegration

Notes: *** is 1% significance level. k is the number of regressors. Equation (3) is estimated by imposing a maximum of four lags on each first differenced variable and followed by Akaike Information Criterion (AIC) to select the optimum lags

run coefficients have the theoretically expected signs. As for the long-run effects, all capital market variables carry their expected positive sign in all regressions, supporting the supply-leading relationship. These results are very similar to Thumrongvit *et al.* (2013), Nordin and Nordin (2016) and Coşkun *et al.* (2017), but contradict the findings of Opoku *et al.* (2019) and Appiah *et al.* (2020). Specifically, bond market variables (LCB and LSUKUK) and growth are not statistically significant. Stock market variables, on the other hand, exert a highly significant positive impact, regardless of the indicator used (Models 1 and 2). This indicates that, a 1% increase of stock market turnover (LSMTURN), *ceteris paribus*, raises real GDP per capita (LGDPPC) by about 0.30%, while the corresponding effect from stock market capitalization (LSMC) is 0.38% in Malaysia. The employment growth rate (LNE) has a negative sign and is significant in all models implying that if employment keeps increasing while the capital stock remains constant, this may lead to the use of less capital per worker and may reduce income per capita.

Moving forward, an alternate approach of supporting cointegration of the model is shown in Table 5 (Panel B). The parameter estimates on the lagged error correction term (ECT_{t-1}) are highly significant at 1% level and carry an inverse sign in all specifications. This reinforces that a cointegrating relationship indeed exists among the underlying variables. For instance,

Variables	Dependent variable: LGDPPC Model 1 Coeff	*t*-stat	Model 2 Coeff	*t*-stat
Panel A: ARDL long-run coefficients				
LSUKUK	0.0234	1.3557	0.0080	0.7969
LCB	0.0471	0.4911	0.0353	1.0477
LSMC	0.3784	2.8953***		
LSMTURN			0.3025	6.8182***
LNE	−0.8993	−2.5331**	−0.3414	−3.7400***
C	−3.3235	−2.4526**	−1.9256	−3.9353***
Panel B: Short-run coefficients				
	Dependent variable: D(LGDPPC)			
Variables	Coeff	*t*-stat	Coeff	*t*-stat
D(LGDPPC(−1))			0.1478	2.0952**
D(LCB)	0.0041	1.0197		
D(LCB(−1))	−0.0084	−2.0525**		
D(LSMC)	0.0801	2.8141***		
D(LSMC(−1))	0.1478	5.5317***		
D(LSMTURN)			0.0218	3.3720***
D(LSMTURN(−1))			−0.0121	−1.9045*
D(LNE)	−0.0508	−7.3947***		
D(LNE(−1))	0.0140	1.8826*		
QUARTER = 1	−0.0564	−10.2328***	−0.0498	−10.2448***
QUARTER = 2	−0.0037	−0.6377	0.0170	2.8454***
QUARTER = 3	0.0207	4.1503***	0.0199	4.1098***
ECM(−1)	−0.0927	−6.1827***	−0.1359	−8.7076***
Panel C: Diagnostic tests				
		Prob.		Prob.
LM(2)	0.3692	0.8314	2.7120	0.2577
LM(4)	1.6872	0.7930	5.3979	0.2489
ARCH(2)	2.2276	0.3283	0.1713	0.9179
RESET(1)	5.1824	0.0261**	1.9949	0.1623
JB	0.9479	0.6225	1.4705	0.4794

Notes: ***, ** and * are 1, 5 and 10% significance levels, respectively. k is the number of regressors. LM = Breusch–Godfrey Serial Correlation LM test for serial correlation; ARCH = Autoregressive conditional heteroskedasticity test; RESET = Ramsey's RESET test for functional form; JB = Jacque–Bera test for normality of residuals. Optimal lag length is selected by the Akaike Information Criterion (AIC)

Table 5.
The long-run and short-run estimates

the error correction coefficients for Models 1 and 2 are −0.0927 and −0.1359, respectively, suggesting that on average approximately 9.3 and 13.6% of the deviation from the long-run equilibrium is adjusted in the following quarter.

Lastly, various diagnostic tests are illustrated at the bottom part of Table 5. The two models pass the diagnostic checks, revealing that the residuals are independent, homoscedastic and normally distributed except for the model misspecification in Model 1. Alternatively, both the CUSUM and CUSUM squared tests confirm the stability of parameter at a 5% level (Figure 2).

Robustness checks

Tables 6 and 7 provide the estimation results when conventional bonds (LCB) and *ṣukūk* (LSUKUK) are replaced with total conventional bonds and *ṣukūk* (LCBS). Using the same

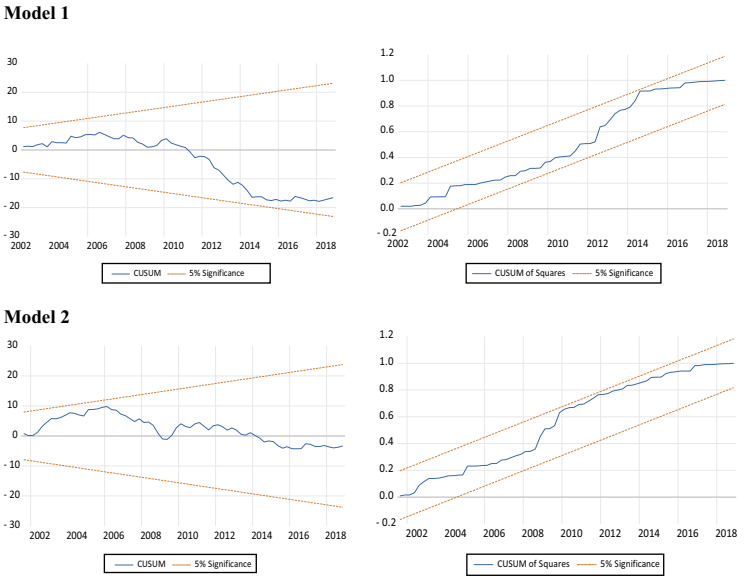

Figure 2.
CUSUM and CUSUM squared

Model		Calculated *F*-statistic		Critical bound values	1%	5%	10%
3	LGDPPC = f(LCBS, LSMC, LNE)	10.9938***	*k* = 3	*I(0)*	4.0480	2.9460	2.4820
4	LGDPPC = f(LCBS, LSMTURN, LNE)	14.1328***		*I(1)*	5.0920	3.8620	3.3340

Notes: *** is 1% significance level. k is the number of regressors. Equation (3) is estimated by imposing a maximum of four lags on each first differenced variable and followed by Akaike Information Criterion (AIC) to select the optimum lags

Table 6.
The bounds test for cointegration: an alternative measure

specifications and independent variables, Tables 6 and 7 would yield results identical to those in Tables 4 and 5. Table 6 also reveals a clear rejection null hypothesis of no cointegration at 1% level of significance. Thus, there is compelling evidence for a long-run relationship among economic growth and capital market variables. Moreover, Table 7, Panel A shows that the total conventional bonds and *ṣukūk* (LCBS) variables remain positive, albeit statistically insignificant. Meanwhile, the stock market variables continue to exert a positive and significant influence. The parameter estimates reflect that, *ceteris paribus*, there are about 0.35 and 0.30% rise in real GDP per capita (LGDPPC) with a 1% rise in stock market capitalization (LSMC) and total stock market turnover (LSMTURN), respectively. These empirical results are robust regardless of the choice of bond market variables. Lastly, Panel C of Table 7 and Figure 3 show the results for diagnostic checks, indicating that Models 3 and 4 pass all diagnostic checks except serial correlation in Model 3.

Specifically, these empirical results are broadly in accordance with the supply-leading view, suggesting that financial development is a key driver of output growth. The findings are very close to the results stated by Thumrongvit *et al.* (2013) that conventional bonds do not significantly affect economic development. However, the findings are dissimilar to

Variables	Dependent variable: LGDPPC Model 3 Coeff	*t*-stat	Model 4 Coeff	*t*-stat
Panel A: ARDL long-run coefficients				
LCBS	0.0189	0.2162	0.0393	1.2113
LSMC	0.3517	3.2284***		
LSMTURN			0.3024	7.6459***
LNE	−0.6231	−2.2873**	−0.3463	−3.7297***
C	−1.9508	−2.1038**	−1.9304	−4.0604***
Panel B: Short-run coefficients				
	Dependent variable: D(LGDPPC)			
Variables	Coeff	*t*-stat	Coeff	*t*-stat
D(LGDPPC(−1))	0.2016	2.9487***	0.1539	2.1772**
D(LCBS)	−0.0014	−0.3174		
D(LCBS(−1))	−0.0099	−2.3521**		
D(LSMC)	0.0610	2.1506**		
D(LSMC(−1))	0.1069	3.9356***		
D(LSMTURN)			0.0212	3.2749***
D(LSMTURN(−1))			−0.0125	−1.9449*
QUARTER = 1	−0.0528	−9.9388***	−0.0494	−10.1251***
QUARTER = 2	0.0147	2.3566**	0.0177	2.9767***
QUARTER = 3	0.0251	5.2815***	0.0199	4.0762***
ECM(−1)	−0.0806	−7.6260***	−0.1341	−8.6397***
Panel C: Diagnostic tests				
		Prob.		Prob.
LM(2)	8.0953	0.0175**	2.6279	0.2688
LM(4)	9.2203	0.0558*	5.3739	0.2510
ARCH(2)	2.2374	0.3267	0.3343	0.8461
RESET(1)	2.1881	0.1437	2.2660	0.1367
JB	1.4465	0.4852	2.1312	0.3445

Notes: ***, ** and * are 1, 5 and 10% significance levels, respectively. k is the number of regressors. LM = Breusch–Godfrey Serial Correlation LM test for serial correlation; ARCH = Autoregressive conditional heteroskedasticity test; RESET = Ramsey's RESET test for functional form; JB = Jacque–Bera test for normality of residuals. Optimal lag length is selected by the Akaike Information Criterion (AIC)

Table 7.
The long-run and short-run estimates: an alternative measure

Nordin and Nordin (2016) and Smaoui and Nechi (2017). Nordin and Nordin (2016) found a significant role of the debt market in the Malaysian economy. This, of course, is not surprising as the debt market consists of public debt (also known as government/sovereign debt) and private debt (corporate debt). Similarly, Smaoui and Nechi (2017) suggested that *ṣukūk* may promote economic growth.

Conclusion and policy implications

Although financial markets have become increasingly important worldwide, there remains a lack of discourse on Islamic financial development and output growth. The growing demand for and supply of *ṣukūk* deserves to be documented, especially its role in stimulating economic development. Subsequently, the study aims to explore the impact of the capital market by considering the role of *ṣukūk* and other sub-components on economic growth in Malaysia from 1998 to 2018. Overall, the ARDL cointegration bounds test provided the evidence of a long-run relation among economic growth and capital market variables.

Figure 3.
CUSUM and CUSUM squared: an alternative measure

Specifically, the empirical results suggest that *ṣukūk* and conventional bonds are not the driving forces of economic growth in the long-term. In contrast, stock market development irrespective of its proxy (stock market capitalization or total stock market turnover) would be able to foster long-term growth.

Despite the fact that *ṣukūk* shows no important effect on economic growth over the studied period, Malaysia remains the leading player in the global *ṣukūk* market. Malaysia is not only the issuer for domestic investors but also an arranger for international investors. If the central authority intends to lift the *ṣukūk* market, a strategic framework should be made, especially in pricing efficiencies, where Malaysia is still lacking. Another hindrance for *ṣukūk* issuance among corporate players is the lack of Sharīʿah-compliant assets available, hence contributing to a limited supply of AA-rated papers against the large appetite for stable fixed-income assets, and this contributes to a reduction in secondary trading.

It is recommended that the government encourage more awareness and promote a mentality shift on the impact of *ṣukūk* investment (for instance, achieving social objectives without compromising commercial returns) among conventional bond investors. For example, responsible investing/green *ṣukūk* could be promoted in the market. The primary limitation of this study is that it considers only corporate *ṣukūk*; government *ṣukūk* are excluded from the estimation due to a lack of requisite information, resources and data. To obtain better results, future research is needed to account for both corporate and government *ṣukūk* for greater impact on output growth.

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