Dynamic Relationship between Sovereign Bond and Sukuk Market Developments in Indonesia

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ABSTRACT

This study assesses the impact of sovereign bond and sukuk market (Islamic bond market) development, as one of Indonesia's financing instruments, on the growth of its economy and vice versa. It uses the 2009-2016 quarterly longitudinal data of outstanding bond and sukuk as a proxy of the size of the bond and sukuk markets, as well as the GDP of Indonesia as a proxy of the size of its economy. The VAR model and granger causality test were used to determine the direction of causality while Impulse Response Function and Variance Decomposition analysis measured the impact of shock on each variable of the economy. The results show that only sovereign sukuk has a positive impact on the Indonesian economy which means it is more productive compared with the conventional sovereign bond.

Keywords: Bond, Indonesian economy, sukuk, VAR

INTRODUCTION

The Indonesian economy was badly hit in the 1998 global financial crisis due to the size of its foreign loans both from private and government sector. Large amounts of foreign debt have a high exchange rate fluctuations risk and will be a burden if the debt is not effectively allocated. As the rupiah appreciates, it becomes less competitive in the international market. Given the large amount of debt held by Bank Indonesia, but not supported by good fiscal and monetary policies, and the country's unhealthy banking system, the rupiah began to depreciate (Nasution, 1998). At the time, Bank Indonesia did not have sufficient US dollar to maintain the value of the rupiah value, and the government finally decided to change the floating exchange rate regime into a free-floating one on August 14, 1997.

However, the rupiah began to depreciate sharply which led to very high interest rates, and free-falling value of Indonesia's Stock Exchange. Many banks and finance companies declared themselves bankrupt which consequently led to a sharp decline in Indonesia's GDP growth rates, increased inflation and unemployment (Nasution, 1998).
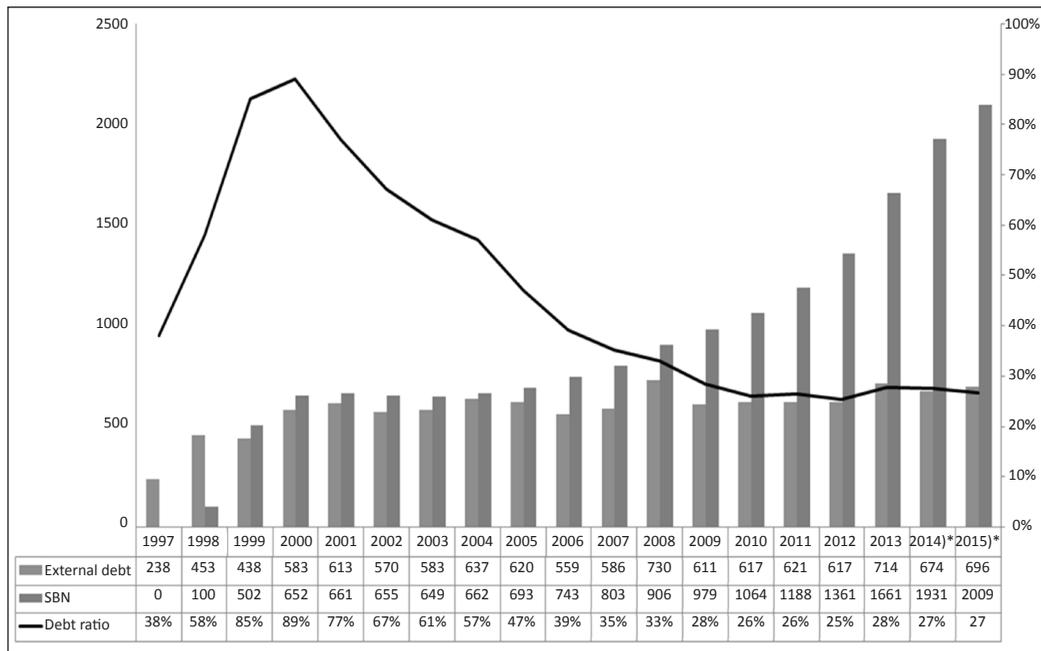

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014)*	2015)*
External debt	238	453	438	583	613	570	583	637	620	559	586	730	611	617	621	617	714	674	696
SBN	0	100	502	652	661	655	649	662	693	743	803	906	979	1064	1188	1361	1661	1931	2009
Debt ratio	38%	58%	85%	89%	77%	67%	61%	57%	47%	39%	35%	33%	28%	26%	26%	25%	28%	27%	27

Figure 1. Graph of proportion of government debt (IDR Trillion)
Source: Directorate General of Financing and Risk Management (DJPPR), Ministry of Finance, 2017

Exchange rate fluctuations caused debt-based financial instruments to be vulnerable to swelling when the creditor currency exchange rate sharply depreciates, as was the case in 1998. Therefore, the Indonesian government transferred its sources of funds into the domestic financial market which was relatively more resistant to exchange rate fluctuations. Figure 1 shows that the Indonesian government has carried out foreign debt transfers since 1998. In 1997, the proportion of government foreign debt amounted to 100% of the total government debt. However, post 1998, government debt was been transferred into SBN (Surat Berharga Negara – sovereign bonds) which are primarily held by domestic investors (Ministry of Finance, 2017). It only took two years until they were able to dominate the proportion of government debt instruments. By 2015, the issuance of SBN had doubled the government's foreign debt. The SBN as seen in Figure 1 does not only comprise bond financial instruments. In 2008, the government began to issue a new type of bond to comply with the Islamic custom

of not charging interest. This financial instrument is called sukuk or the sovereign Islamic bond (SBSN). Indeed, the issuance of sovereign sukuk in 2008 enriched the options in respect of government-owned financing management.
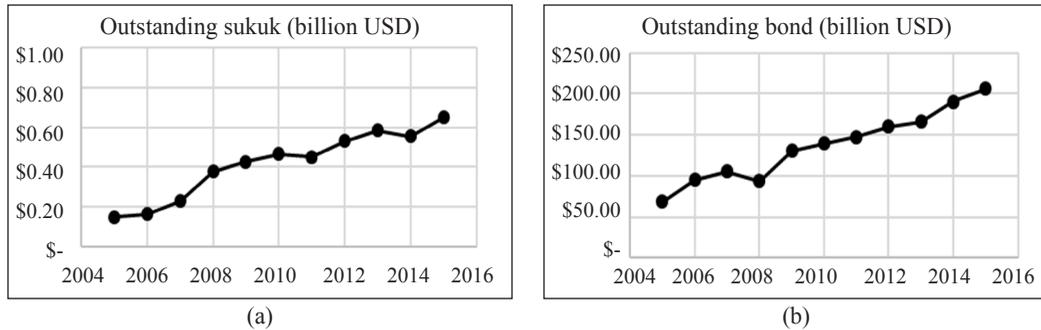

Figure 2. Graph showing the the development of: (a) sukuk; and (b) bond market
Source: The Financial Services Authority, 2017

Figure 2 shows bond and sukuk markets in Indonesia are showing a positive trend. In terms of outstanding value, the development of the sukuk market is still far below the conventional bond market but the former has a larger growth rate than the latter. Although on aggregate, the size of the bond market is much greater than the sukuk market, the growth rate of sukuk (14.3%) is bigger than the growth rate of bonds (9.87%). This research will attempt to find out whether the development of the sukuk market impacts positively on the country's GDP growth rate.

Only a few studies have discussed the relationship between sukuk and the economy. Furthermore, there is no specific research that examined the relationship between sukuk market development and the Indonesian economy which this study intends to do. It will also discuss the relationship between bond market development and the Indonesian economy with a specific focus on the sovereign sukuk and bonds traded within the internal market.

LITERATURE REVIEW

The negative impact of foreign loans in developing countries has been widely researched. Reinhart and Rogoff (2010) found that when a country's foreign loans, both from the government and private sectors, reached 60% of its GDP, it will have 2% negative impact on its growth. Even if the level of loans is above 60%, the perceived negative impact may equate to 50% of GDP growth (Pattillo, Poirson, & Ricci, 2011). When different levels of debt are involved, Schclarek (2004) found that the negative impact of foreign loans will begin to decline at a level of 35–40% debt to GDP. This negative impact is caused by government loans. In Indonesia, the ratio of foreign debt to GDP is still relatively small compared with the Eurozone, which is still below 40%, but this ratio has experienced a positive trend amounting to 25% since 2011 (Ministry of Finance, 2017).

Domestic bond and sukuk markets are considered as alternative sources of

funds for the government. Theoretically, according to the IS-LM model, increased bond or sukuk issuance can affect the growth of a country's GDP (Mankiw, 2008). For example, the Ministry of Finance issues sukuk to finance government projects. Decreases in money supply result in a shift in the LM curve to the left. If there is an increase in spending by the finance ministry the IS curve will shift to the right that is automatically accompanied by an increase in GDP. The level of government spending will determine whether the GDP will be increased from the starting point or not.

In determining which assets are going to be held or owned by the public, there are a few factors that need to be considered, and each assumed ceteris paribus. The first is wealth, which is the total resources owned by society, including the assets, for example, income. The second is expected return (estimated return rate), which is an estimate of changes in asset value in the future. The third is risk, namely how big the risk of losses borne by society in holding an asset. The last is liquidity level, namely how fast the asset can be exchanged into more liquid assets (Mishkin, 2010).

Many studies have explored the relationship between the development of the bond market and the economy. Using a VAR model, the domestic sovereign bond market development has proven to granger cause economic growth (Pradhan et al., 2015). Earlier, Fink, Haiss and Hristoforova (2003) reported similar findings, that bond market is proved to have causality with the economy. Using a different model,

Thumrongvit, Kim and Pyun (2013) found that bond market is positively correlated to the economy.

In the reverse direction, Godlewski, Turk and Weill (2011) discovered that the market has positive or neutral responses to the issuance of bonds, while negative on the issuance of sukuk. Using simple OLS and GLS methods, Bhattacharyay (2013) found that economy promotes bond market development. In an earlier research, using VAR model, Pradhan, Arvin, Bennett, Nair and Hall (2016) also found that economic growth granger cause bond market development.

In contrast to the plethora of previous studies which had analysed the impact of bonds issuance with economic growth, there is limited research focusing on the relationship between sukuk market development and the economy growth. Ahmad, Daud and Kefeli (2012) examined the relationship between sukuk and Malaysia's economic growth. Using a VAR model, she reported that sukuk issuance had a positive impact on the Malaysian economy. As this topic has not been previously discussed with reference to Indonesia, this research is expected to break new grounds.

MATERIALS AND METHODS

This study analyses the influence of bond and sukuk market developments on the Indonesian economy, and vice versa (i.e. the influence of the Indonesian economy on bond and sukuk market developments). Therefore, the most appropriate model to be used in this study is vector autoregression

(VAR) as a base model in order to measure the causality and impact of each variable on the other. The Granger causality test was used to determine the causality among the variables. The impulse response function (IRF) traces the responsiveness of the dependent variables in the VAR to shocks to each of the variables. Meanwhile, variance decomposition (VD) provides the proportion of the movements in the dependent variables that are due to their 'own' shocks compared to shocks with the other variables (Brooks, 2014).

Variables used in this study are *odgov, sdgov, and GDP.* Longitudinal data from Q1 of 2009 to Q4 of 2016 in logarithmic form are used. Odgov is sovereign bond market development, sdgov is sovereign sukuk market development, and GDP is Indonesian real GDP. Market development referred to in this study is proxied by the number of outstanding domestic sovereign bonds and sukuk. The selection of proxy for the variables in this study follows Fink et al. (2003) while the ordering of variables follows Pradhan et al. (2015).

VAR model used in this research:

$$Y_t = A_0 + AY_{t-1} + \varepsilon_t \qquad (1)$$

Where:

$$Y_t = \begin{bmatrix} PDB_t \\ Odgov_t \\ Sdgov_t \end{bmatrix};$$

$$A_0 = \begin{bmatrix} \alpha_{11} \\ \alpha_{21} \\ \alpha_{31} \end{bmatrix};$$

$$A = \begin{bmatrix} \alpha_{12} & \alpha_{13} & \alpha_{14} \\ \alpha_{22} & \alpha_{23} & \alpha_{24} \\ \alpha_{32} & \alpha_{33} & \alpha_{34} \end{bmatrix};$$

$$v = \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \qquad (2)$$

RESULTS

The interpretation of VAR model is not the focus of this research which will look at the results of Impulse Response Function (IRF) and Variance Decomposition (VD). However, VAR model estimation results are important in estimating IRF and VD models.

The variables in the equation are stationary at different levels. The GDP and aggregate sukuk are stationary at level whereas the other variables are stationary at the first difference. So, the model to be used is a VAR in difference because a VECM model can only be used if the variables in the equation have the same stationarity level. Optimal lag determination takes into consideration some key criteria as well as additional criteria. The first smallest value obtained by using the AIC criterion is found in lag 1. Unlike the AIC, the SC value indicates that the optimum lag value lies in lag 0. However, other criteria show the optimum lag value lies in lag 1. Therefore, the decision was made to use lag 1. A stability test also shows that this model is stable.

After passing the stability test stage, a Granger causality test is conducted to determine the direction of causality between the variables. Table 2 depicts the relationship

between domestic sovereign bonds and sukuk and Indonesian GDP. Hypothesis 0 in the Granger causality test states that there is no Granger causality between the two variables. The criteria for rejection is shown by *F-statistics* value which is greater than the critical value of 10%, or we can use Prob> F smaller than 0.1 confidence level. Referring to the result, there is supply leading the relationship between Sdgov and GDP.

Table 1
Stationarity test, results of data processing with EVIEWS

Variable (in log)	Test Statistics	Mc Kinon critical value			Information
		1%	**5%**	**10%**	
PDB	-3.139210	-3.711457	-2.981038	-2.629906	Stationary
Odgov	2.628810	-3.661661	-2.960411	-2.619160	Not stationary
Sdgov	-0.979859	-3.699871	-2.976263	-2.627420	Not stationary

Table 2
Granger causality test, results of data processing with EVIEWS

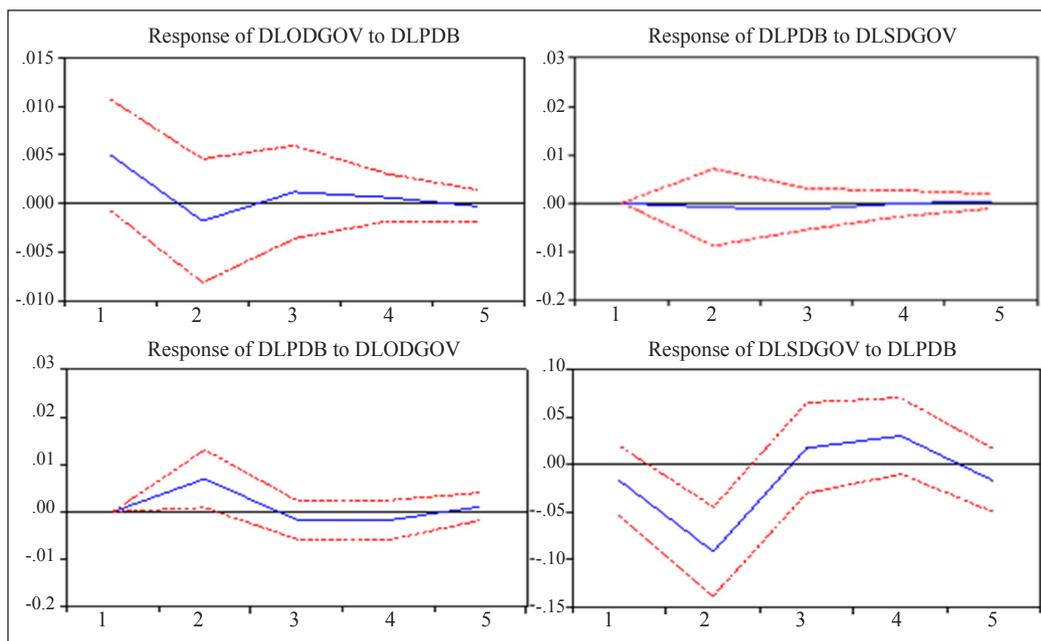| H_0	F statistics	Prob> F	Information
Odgov does not G*ranger cause* GDP	2.59735	0.1183	H0 accepted
Sdgov does not *Granger cause* GDP	5.68414	0.0241	H0 rejected
GDP does not Granger cause Odgov	2.22468	0.1470	H0 accepted
GDP does not Granger cause Sdgov	0.03825	0.8463	H0 accepted

Figure 3. Graph of IRF results, results of data processing with EVIEWS

According to IRF results shown in Figure 3, since the beginning of the period, ceteris paribus, GDP negatively responds to the shock of *outstanding* domestic sovereign bonds, reaching a peak in the fourth period: -0.000112 or -0.01%. In the next period, the effect of *shock* of bond to GDP begins to disappear or can be interpreted as taking approximately five quarters for GDP to return to its long-term equilibrium. On the other hand, GDP positively responds to the shock of outstanding domestic sovereign sukuk, reaching a peak in the second period: 0.006957 or 0.70%. In the next period, the effect of shock on domestic sovereign bond to GDP begins to disappear or can be interpreted as taking approximately three quarters for GDP to return to its long-term equilibrium. Meanwhile, in the opposite direction, the response given by the domestic sovereign bond to shocks that occur in GDP by one standard deviation has a positive influence only in the first period: 0.004981 or 0.50%. The response begins to disappear in the second period. In contrast to bonds, the response given by the domestic sovereign sukuk to shocks that occur in GDP by one standard deviation has a negative effect until it reaches a peak in the second period: -0.010974 or -1.10%. The response lasts until the second period and only begins to disappear in the third period.

The result of variance decomposition result (see appendix) show that, in the first period, shock to GDP is only affected by itself. Only in subsequent periods does the proportion of GDP shock to GDP begin to decline because there is an increase in the effect coming from the shock of the bond and sukuk market to GDP. In the second period, 11.13% of GDP shock is attributed to the shock of sukuk, while bonds account for 5.7% of GDP. The increased shock effect between bonds and sukuk is consistently dominated by sukuk for up to five periods. However, in the opposite direction, shock on domestic sovereign bonds and sukuk is affected by the shock on GDP. Nevertheless, the effect is greater in the sukuk market. The influence of a given GDP shock on domestic sovereign sukuk quite drastically increased in the second period with a value of 42.94%, which initially only affected 2.96%. It affected domestic sovereign bond only around 9% since the second period and continues to increase.

DISCUSSION

Based on the Granger causality test, it is clear domestic sovereign sukuk has a significant positive influence on GDP. The estimation results are in line with those of two previous studies by Ahmad et al. (2012) and Echchabi et al. (2016).

Sovereign bond funds can be used for various purposes. They are used primarily to finance APBN (Government Budget) deficit, closing short-term cash shortages due to inconsistencies between the cash flow of revenues and expenditures from the state treasury account (Rekening Kas Negara) within a budget year, as well as managing debt portfolio (Law of the Republic of Indonesia Number 24 Year 2002 on Sovereign Debt Securities Article 4 points a, b, c). According to Suminto

(personal communication, June 18, 2017), the negative impact of sovereign bonds to GDP caused using bond proceeds prior to 2014 is relatively large, earmarked for unproductive subsidies rather than for capital expenditure. Meanwhile, majority of the funds generated by sukuk are consistently allocated to capital expenditure. Figure 4 compares the expenditure on subsidies and capital which proves that domestic sovereign sukuk has potentially higher yields and boosts economic growth in Indonesia.
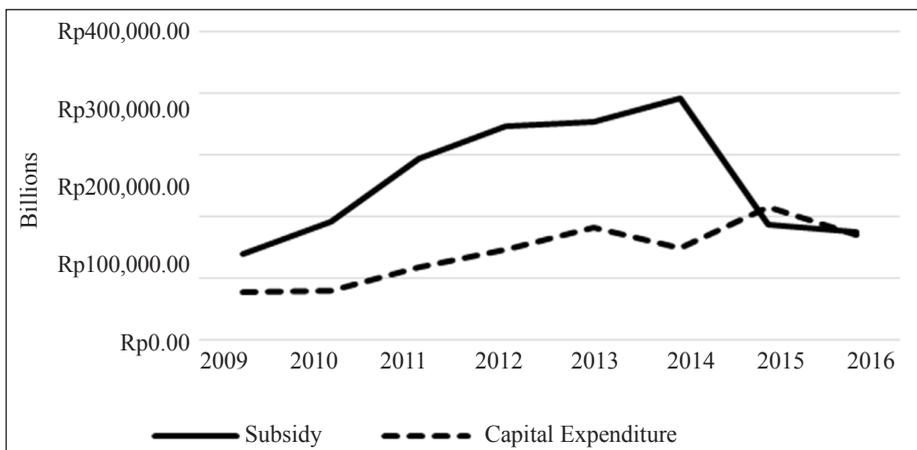

Figure 4. Graph of comparison of subsidies and capital expenditure in local currency, government financial statements
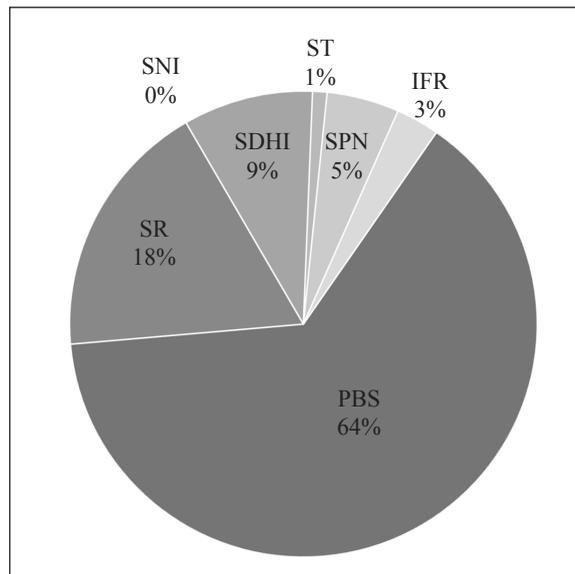*Source*: Ministry of Finance, 2017

Figure 5. Pie chart of outstanding sovereign sukuk Indonesia as of December 2017
Source: Ministry of Finance, 2017

Figure 5 shows sukuk instruments traded in Indonesia are dominated by Retail (SR) and Project-Based Sukuk (PBS). This sukuk is predominantly used to raise funds for government projects, such as infrastructure development programmes (energy, telecommunications, transportation, agriculture, manufacture, and property), provision of public services, empowerment of local industries, and other development programmes in accordance with the government's strategic plan. The SDHI (Pilgrimage Fund Sukuk) and ST (Saving Sukuk) are not classified as tradable securities.

In the reverse direction, both relationships do not have any significant causality. Neglecting granger causality test result, it appears that only domestic sovereign bond has positive responses to GDP increases. While domestic sovereign sukuk has negative responses to the increase in GDP. This finding was corroborated by Godlewski et al. (2011) that the market has positive or neutral responses to the issuance of bonds, while negative on the issuance of sukuk. The positive influence that GDP has on these bonds proves the theory of bond demand. Therefore, an increase in GDP or public purchasing power in general also increases the number of outstanding bonds. One possible reason is a high level of bond liquidity which means active bonds are traded on the exchange and provide greater opportunities for investors to get capital gains from bond trading.

As with bonds, the negative effect that GDP has on sukuk means that an increase in GDP decreases the number of outstanding sukuk. The results of this study indicate that sukuk is a financial instrument that has relatively fewer enthusiasts compared with bonds. It means that when public purchasing power increases, they switch to other financial instruments that is more profitable or just increase their consumption. One reason could be public investment trends that are still relatively lower than the tendency for consumption. Members of the Board of Commissioners of OJK Kusumaningtuti S. Soetiono stated that the trend of MPS decline has occurred since 2011, and in 2013 the end of the ratio is below marginal propensity to consume (MPC), which means that people tend to consume higher than the tendency to save or invest. Another reason is that the characteristics of the sukuk market in Indonesia tend to be less liquid than other financial instruments, which means that the sukuk is not actively traded in the stock exchange, and minimises the opportunity for investors to obtain capital gain from trading sukuk. This finding is supported by Said and Grassa (2013) stating that the market share of sukuk is dominated by investors who tend to be passive and hold on to it until the end of the maturity. The majority of investors in the financial market however, tend to increase their demand for other financial instruments when their income increases.

CONCLUSION

Theoretically, the effects of bond and sukuk market developments on GDP depend on the productivity as a result of using the funds. The positive influence of sukuk is almost certainly due to the characteristics of the securities that would require underlying assets to be executed by the investor when default occurs. Therefore, at least sukuk issuance will have an impact as much as the underlying assets. It could also leverage on GDP more than the underlying assets.

The government is urged to provide greater incentives to encourage the development of the sukuk market which has proven to have a positive impact on the economy. As the current government is heavily committed to building infrastructure, it should increase its sukuk issuance, especially for its infrastructure development. It is recommended future research examines other variables, such as the international sovereign bond and sukuk market, which should be incorporated into the model to explore whether the risk of exchange rate fluctuation could be minimised using sukuk.

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APPENDICES

IRF Results
Decomposition Results

Response of DLPDB			
Period	DLPDB	DLODGOV	DLSDGOV
1	0.019933	0.000000	0.000000
	(0.00257)	(0.00000)	(0.00000)
2	-0.003502	-0.000872	0.006944
	(0.00406)	(0.00398)	(0.00306)
3	-0.006953	-0.001247	-0.001737
	(0.00354)	(0.00211)	(0.00204)
4	0.003451	-0.000112	-0.001810
	(0.00310)	(0.00136)	(0.00211)
5	0.001231	0.000389	0.001115
	(0.00257)	(0.00075)	(0.00144)

Response of DLODGOV			
Period	DLPDB	DLODGOV	DLSDGOV
1	0.004981	0.015322	0.000000
	(0.00287)	(0.00198)	(0.00000)
2	-0.001815	0.004774	-0.000667
	(0.00318)	(0.00306)	(0.00231)
3	0.001162	0.001154	-0.000774
	(0.00240)	(0.00195)	(0.00139)
4	0.000598	0.000602	0.000119
	(0.00123)	(0.00087)	(0.00069)
5	-0.000300	8.21E-05	0.000188
	(0.00083)	(0.00042)	(0.00041)

Response of DLSDGOV			
Period	DLPDB	DLODGOV	DLSDGOV
1	-0.017234	-0.019488	0.096795
	(0.01816)	(0.01785)	(0.01250)
2	-0.091405	-0.036487	0.002104
	(0.02324)	(0.01916)	(0.01421)
3	0.017199	-0.004012	-0.031391
	(0.02380)	(0.02187)	(0.01636)
4	0.029835	0.002699	0.010422
	(0.02001)	(0.00908)	(0.01232)
5	-0.017455	-0.000638	0.007522
	(0.01648)	(0.00603)	(0.01020)

Variance
Decomposition Results

Variance Decomposition of DLPDB:			
Period	S.E.	DLPDB	DLODGOV	DLSDGOV
1	0.019933	100.0000	0.000000	0.000000
2	0.022192	83.16790	5.700605	11.13149
3	0.023564	82.46897	6.677949	12.938921
4	0.023886	82.35252	6.502102	12.596174
5	0.023968	82.05497	6.563881	12.696212

Variance Decomposition of DLODGOV:			
Period	S.E.	DLPDB	DLODGOV	DLSDGOV
1	0.016111	9.557691	90.44231	0.000000
2	0.017306	9.383828	89.613102	1.003065
3	0.017411	9.716442	88.978754	1.304807
4	0.017435	9.807428	88.862994	1.329575
5	0.017439	9.831935	88.822312	1.345754

Variance Decomposition of DLSDGOV:			
Period	S.E.	DLPDB	DLODGOV	DLSDGOV
1	0.100230	2.956580	3.780226	93.26319
2	0.141939	42.94454	9.964266	47.091199
3	0.148213	40.73189	11.580115	47.687999
4	0.152336	42.39259	11.882138	45.725267
5	0.153528	43.02953	11.700126	45.27035