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Article

How Financial Risk Affects Indonesia Sovereign Sukuk Market Development

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ABSTRACT - Global bond market attention is starting to witness very interesting developments in the development of Sukuk. However, the academic literature on the determinants of the development of the Sukuk market is still new and very limited. Using the Vector Autoregression (VAR)/Vector Error Correction Model (VECM) method, this study examines how the financial risk component influences the development of the Indonesian sovereign Sukuk market. Data was collected from Bank Indonesia and Indonesia's Directorate General of Financing and Risk Management on the External Debt Statistics database for ten years from 2013Q1-2023Q1. The results of this study indicate that the foreign Debt Service Ratio (DSR) and Exchange Rate (EXC) significantly affect the development of the sovereign Sukuk Market. The foreign DSR has a negative effect, while the EXC positively affects the development of the sovereign Sukuk market. Meanwhile, the ratio of foreign debt to Gross Domestic Product (GDP) has an insignificant effect on the development of the sovereign Sukuk Market. The findings advocate policymakers in Indonesia on the importance of strengthening financial stability and regulating the issuance of Sukuk in accordance with the associated financial risks to develop the Sukuk market properly.

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INTRODUCTION

The development of global Sukuk in 2021 still recorded positive and stable developments. Despite dealing with the rapidly emerging COVID-19 conditions, global Sukuk circulation has grown to USD 775 billion in 2021, with 12.5% y-o-y growth (IFSB, 2022). Based on the International Islamic Financial Market Sukuk Report (IIFM, 2022), outstanding Sukuk globally is also dominated by sovereign Sukuk, with a portion of 46% of all outstanding Sukuk globally. Indonesia is third in the largest portion of outstanding Sukuk globally, with a portion of 14.72%. This data reveals that Indonesia is included as the country with the largest portion of outstanding Sukuk globally in 2021.

According to the Ministry of Finance Indonesia (2018), the government is committed in continuing to encourage the development of sovereign Sukuk since, apart from being an instrument for financing the State Revenue and Expenditure Budget (APBN), the issuance of sovereign Sukuk also aims to be investment diversification for investors. Outstanding sovereign Sukuk in 2013 amounted to 109 billion rupiah, then increased rapidly in 2023 to reach 1,059 billion rupiah. This increment grew by 950 billion rupiah over ten years.

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Klein and Weill (2016) argued that by studying outstanding Sukuk, researchers can observe the performance of the Sukuk from time to time and how the Sukuk is influenced by other macroeconomic factors. Meanwhile, Boujlil et al. (2020) highlighted that in a macroeconomic context, a comparative analysis between the outstanding performance of Sukuk and other financial instruments can provide more insight into the unique characteristics and advantages of Sukuk.

In 1997, the proportion of government foreign debt was 100% of the total government debt. However, in 1998, the government's debt was converted into Government Securities (SBN), which were predominantly held by domestic investors. In 2015, the issuance of SBN doubled the government's foreign debt (Mitsaliyandito et al., 2017). The condition of government foreign debt and private loans suggests Indonesia's high obligation to repay principal and loan interest (Malik & Kurnia, 2017).

Theoretical and empirical studies on the determinants of the development of the Sukuk market in developed and developing countries have increased over the past few years, revealing the importance of the development of the Sukuk market in the process of economic growth and development (Ahmad & Muda, 2013; Al-Raeai et al., 2019; Aman et al., 2019; Arshad et al., 2017; Asri & Dwi Wulandari, 2021; Basyariah et al., 2021; Muharam et al., 2019; Nafisah et al., 2020). Furthermore, Baita et al. (2023) demonstrated the significance of regulators and investors seeing sound finances in developing the Sukuk market in Organization of Islamic Cooperation (OIC) member countries.

In addition, the most prevalent risks in the obligations are market, credit, liquidity, and currency risks (Tariq & Dar, 2007). Notably, adequate Sukuk and finance make it possible to avoid those risks but not with the financial risk (Al-Raeai et al., 2019; Al-Sayed, 2013; Balli et al., 2021). Unfortunately, empirical studies of the Sukuk market related to financial risk are neglected since Sukuk is very vulnerable to market and financial risk (Boukhatem, 2022).

A study by Boukhatem (2022) addressed how financial risk affects the development of the domestic Sukuk market in Saudi Arabia. However, further research needs to focus on how financial risk components affect different Sukuk markets, such as sovereign Sukuk. Thus far, the authors have not discovered any research that uses the financial risk component of sovereign Sukuk in general, even those specifically in Indonesia. Hence, this study aims to add empirical validation regarding the possible effects of the Financial Risk components in the Indonesian Sovereign Sukuk market development. This research focuses on outstanding sovereign Sukuk, which are influenced by independent variables such as the debt to Gross Domestic Product (GDP) ratio, Debt Service Ratio (DSR), and Exchange Rate (EXC) (rupiah to US dollar) in Indonesia for a period of ten years from the first quarter of 2013 to the first quarter of 2023.

The next part of the research is presented as follows. Section 2 briefly reviews the literature. Section 3 details the data and methodology. Meanwhile, Section 4 presents the results and discussion. Section 5 concludes the paper.

LITERATURE REVIEW

Sukuk

The word Sukuk comes from the Persian language, namely "jak," and is then entered into Arabic with the name "shak." Goitein (1966) stated that "shak" comes from the word "check or check," which is found in English and means debentures. In terminology, a Sukuk is a piece of paper or a note on which there is an order from someone to pay a certain amount of money to another person whose name is written on the paper (Rodoni et al., 2008). Fatwa of the National Sharia Council No. 32/DSN-MUI/IX/2002 states that it is a long-term security based on Sharia principles issued by issuers to Sharia bondholders, which require the issuer to pay income to Sharia bondholders in the form of profit sharing or margin or fees, as well as repay the bond funds when maturity (OJK). According to the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), Sukuk is defined as "a certificate of equal value representing an undivided share in the

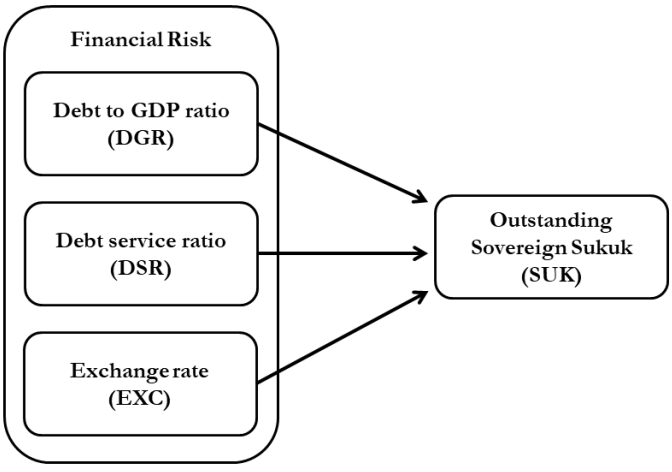
ownership of tangible assets, results, and services, certain project assets from specific investment activities."

Financial Risk

According to Schroeck (2002), risk is defined as the uncertainty or volatility around an average value. It is often measured as the standard deviation or variance. According to Khan and Ahmed (2001), risks can be divided into financial and business risks. Business risk is typically associated with the company's operations, whereas financial risk stems from the probability of loss in the financial market due to financial component changes. According to Sari and Ratno (2020), there are several indicators for measuring debt burden or financial risk, two of which are the DSR and the debt-to-GDP ratio. Consequently, in the International Country Risk Guide (ICRG) guidebook by Howell (2013), several factors are components of financial risk, namely: foreign debt to GDP ratio, foreign DSR, current account to exports of goods and services ratio, international liquidity, and EXC stability.

Conceptual Framework

Research conducted by Boukhatem (2022) discovered that there is an empirical relationship between financial risk and outstanding domestic Sukuk in Saudi Arabia. Financial risks as defined in his research comprised of current account stability, debt service stability, debt to GDP stability, EXC stability, and liquidity levels. The data source in his study uses sources from the ICRG published by the Political Risk Services (PRS) Group, ranging from the first quarter of 2012 to the second quarter of 2021. Using the Autoregressive Distributed Lag (ARDL) method, his study discovers that debt service stability, debt to GDP stability, and EXC stability significantly affect outstanding domestic Sukuk. While current account stability and liquidity level have no significant effect on outstanding domestic Sukuk in Saudi Arabia, the portion of outstanding Sukuk in Saudi Arabia is still dominated by sovereign Sukuk. This research is declared the first on financial risk in the development of Sukuk market.



Source: Modified from Boukhatem (2022)

Figure 1: Conceptual framework

On the other hand, research conducted by Asri and Dwi Wulandari (2021) highlighted that GDP has a negative and significant effect on outstanding Sukuk, while outstanding Sukuk has a positive and significant effect on GDP. At the same time, the EXC has a positive and significant effect on outstanding Sukuk, while outstanding Sukuk has a negative and significant effect on EXCs. In addition, research conducted by Nafisah et al. (2020) discovered that EXCs positively and significantly affect the issuance of sovereign Sukuk in OIC member countries. The results of

the study by Arshad et al. (2017) related to EXCs have a positive and significant effect on sovereign Sukuk yields.

Using a literature review analysis approach, theoretically, the research conducted by Aman et al. (2019) investigated what determinants might contribute to the development of the Sukuk market. It focuses on the dynamics of foreign capital inflows, macroeconomics, and financial factors related to the development of the Sukuk market. This research opened a scientific discussion on Sukuk determinants and invited an empirical explanation of the relationship hypothesised here. In addition, research by Baita et al. (2023) empirically demonstrated the relationship between fiscal policy and government spending on developing the Sukuk market in OIC member countries. The results of fiscal policies, such as public debt and financial deficits, suggested a significant influence on the development of the Sukuk market. At the same time, government spending does not influence the development of the Sukuk market. The conclusion for regulators and investors is the importance of examining healthy finances in developing the Sukuk market.

Conversely, research by Muharam et al. (2019) empirically examined the relationship between the Islamic stock market, the Sukuk market, and economic growth in Indonesia and Malaysia. The results revealed a two-way relationship between the Islamic stock market and the Sukuk market on the development of the Sukuk market in Indonesia, whereas, in Malaysia, there is only a two-way relationship between the Sukuk market and the Islamic stock market. Trade openness then influences the development of the Sukuk market in Malaysia but not Indonesia. Similarly, research conducted by Al-Raeai et al. (2019) empirically evaluated the influence of macroeconomic factors and political risk on the development of the Sukuk market in Gulf Cooperation Council (GCC) countries in the period 2001 to 2016. The results discovered that EXCs, trade openness, and the size of the banking sector are the main factors driving the development of the Sukuk market. Meanwhile, stock market capitalization and saving rates do not have a significant influence on the development of the Sukuk market in GCC countries. In conclusion, the most significant outcome is the positive influence between political risk and the development of the Sukuk market.

Research conducted by Ahmad and Muda (2013) highlighted that the factors of GDP, trade openness, and EXCs significantly influence the development of the Sukuk market in selected OIC member countries. This study concluded that consumption is the main factor in maintaining economic stability. Finally, research conducted by Basyariah et al. (2021) suggested that GDP per capita and the rule-of-law index positively and significantly affect the development of the Sukuk market. This is while inflation and EXCs do not significantly affect the development of the Sukuk market. This study also confirmed previous research on inflation remaining under control at a certain level for economic development.

METHODOLOGY

This study uses data from the first quarter of 2013 to the first quarter of 2023, where this type of data is time-series. This data is secondary data collected from Bank Indonesia and the Directorate General of Financing and Risk Management. This research is quantitative based on positivistic or concrete data. The data collected is in the form of numbers and is measured by statistics as a test tool to generate conclusions from related data. In addition, the data collected in this study are outstanding sovereign Sukuk data, and financial risk data used in this study are the DSR, debt to GDP ratio, and EXCs (Table 1). The statistical test tool used in this study is E-Views 10 with the Vector Autoregression (VAR)/Vector Error Correction Model (VECM) test.

Table 1: Variables and data sources

Variable	Acronym	Description	Source
Outstanding sovereign Sukuk	SUK	Total amount of Sukuk assets outstanding issued by the Indonesian government.	Directorate General of Financing and Risk Management (DJPPR)
Debt to GDP ratio	DGR	Ratio of total foreign debt to GDP.	Directorate General of Financing and Risk Management (DJPPR)
Debt service ratio	DSR	DSR tier 1 (ratio of repayments of external debt principal and interest to current account receipts).	Directorate General of Financing and Risk Management (DJPPR)
Exchange rate	EXC	Indonesian rupiah to US dollar	Bank Indonesia

Source: Author's own

This study was evaluated using the VAR analysis method, and it was first proposed by Sims (1980). The advantage of the VAR method compared to other regression methods is that all variables are considered interrelated. Hence, there is no need to position variables in dependent and independent positions. Another advantage of the VAR analysis method is that it can determine which variables have a dominant influence in the long run. Furthermore, this analysis method can also determine the reciprocal relationship between related variables. The VAR method can be used if the related variables are stationary. If the related variables are not stationary but cointegrated, then the research can be continued using the VECM model. The stages in the VAR/VECM test are the stationarity test, optimal sag selection, cointegration test, VAR/VECM estimation, Impulses Response Function (IRF), and Variance Decompositions (VD).

VAR makes all variables endogenous and reduces the lag in their distribution. In general, the regression equation model in VAR can be written as follows:

$$Yt = A_0 + A_1 Y_{t-1} + A_2 Y_{t-2} + \cdots + ApY_t - p + s_t,$$

with

p = Number of variables in the equation system
k = Number of lags in the equation system
Yt = Vector of dependent variables (Y1t, Y_{2t}, ..., Y_{nt}) with size n x 1,
A0 = Intercept vector with size n x 1,
Ai = Parameter matrix with size n x n, for each i = 1, 2, ..., p,
εt = Residual vector (ε_{1t}, ε_{2t}, ..., ε_{nt}) with size n x 1.

According to Ahmad et al. (2011), if cointegration is discovered in a multivariate time-series model, it indicates the existence of a long-term equilibrium relationship, and the application of VECM is necessary to evaluate short-term time-series cointegration. In time-series case studies with no cointegration, VECM is no longer required in modeling. Therefore, the Granger causality test is immediately used to determine the causal relationship between variables. VECM modeling can be written as follows:

$$\Delta Z_t = \mathcal{T}_1 \Delta Z_{t-1} + .. + \mathcal{T}_{k-1} \Delta Z_{t-k-1} \Pi \Delta Z_{t-1} + \mu + \varrho_t : t = 1, .., T.$$

with

Δ = first difference operator
Z = denotes a vector of variables
μ = parameter deviation
Π = (p x p) matrix of shapes $\Pi = \alpha\beta'$

RESULT

Unit Root Test, Lag Optimum, and Cointegration Test

Table 2: ADF unit root test result

Variable	ADF test statistic	
	Level	First Difference
SUK	-0.920	-9.430
	(0.771)	(0.000)
DGR	-2.464	-3.976
	(0.132)	(0.004)
DSR	-1.375	-9.527
	(0.584)	(0.000)
EXC	-3.321	-8.365
	(0.021)	(0.000)

Source: Processed on EViews 10

Table 3: Optimum lag

Lag	LR	FPE	AIC	SC	HQ
0	NA	2.19E-05	0.621419	0.795572	0.682816
1	**67.53266***	**6.34e-06***	**-0.624112***	**0.246655***	**-0.317126***
2	20.56902	7.46E-06	-0.493855	1.073525	0.05872
3	17.73794	9.22E-06	-0.368071	1.895922	0.430093

Source: Processed on EViews 10

Table 4: Johansen cointegration test

Hypothesised No. of CE(s)	*Eigenvalue*	*Trace Statistic*	*0.05 Critical Value*	*Prob.***
None *	0.560789	56.32505	47.85613	0.0066
At most 1	0.315697	24.23679	29.79707	0.1906
At most 2	0.196506	9.441935	15.49471	0.3261
At most 3	0.023045	0.909277	3.841466	0.3403
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				

Source: Processed on EViews 10

The nominal data transformed into natural log form in this research are SUK and EXC, while the DGR and DSR data are in the form of ratios or percentages. This research applies the Augmented Dickey-Fuller (ADF) unit root test for each variable, and the results can be observed in Table 2. At this level, only the EXC variable is stationary. Meanwhile, other variables, such as SUK, DGR, and DSR, are not stationary. Consequently, at the first difference level, all variables meet the requirements of the unit root test, where all variables are stationary at the first difference.

To determine the optimal lag length, several criteria can be observed, namely Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), or Hannan Quinon Criterion (HQ). In Table 3, it can be observed that most optimum lags, such as AIC and SC, are at lag 1; therefore, this research will continue using lag 1. Table 4 provides the results of the cointegration test, and it can be observed that if there is one cointegration, it indicates the existence of a balanced relationship in the long term. Hence, this research will use VECM estimation.

Vector Error Correction Model (VECM)

This section will discuss VECM estimation on all time-series variables such as SUK, DGR, DSR, and EXC. The VECM result in Table 5 reveals the long-term and short-term relationships between

all variables and the dependent variable SUK. Whether or not the lag of a variable is significant on the dependent variable can be evaluated using the absolute value of the t-statistic and t-table. If the t-table value is smaller than the t-statistic value, it can be concluded that the independent variable significantly influences the dependent variable. Correspondingly, the equation in VECM for the dependent variable SUK is written as follows:

$$D(SUK) = - 0.050959609821*(SUK(-1) - 0.0222234778766*DGR(-1) + 0.0145384313247*DSR(-1) - 8.31671705666*EXC(-1) + 29.2333363953) - 0.334476044347*D(SUK(-1)) - 9.67221787367e\text{-}05*D(DGR(-1)) + 0.00268304151913*D(DSR(-1)) - 0.279110094424*D(EXC(-1)) + 0.0348779481186.$$

Table 5: Long and short run estimates using VECM

Variable	Coeff	T-Stat	T-Table	Significant
Long Run Coefficients (dependent variable: SUK)				
DGR	0.02222	[1.31916]	2.02619	No Significant
DSR	-0.01454	[-2.32776]	2.02619	Significant
EXC	8.31672	[9.53684]	2.02619	Significant
Short Run Coefficients (dependent variable: SUK)				
CointEq1	-0.0510	[-1.64715]	2.02619	
D(SUK(-1))	-0.3345	[-2.06595]	2.02619	Significant
D(DGR(-1))	-0.0001	[-0.01799]	2.02619	No Significant
D(DSR(-1))	0.0027	[2.31464]	2.02619	Significant
D(EXC(-1))	-0.2791	[-0.95709]	2.02619	No Significant
F-statistic		3.667885		
R-*squared*		0.357219		

Source: Processed on EViews 10

Impulse Response Function (IRF)

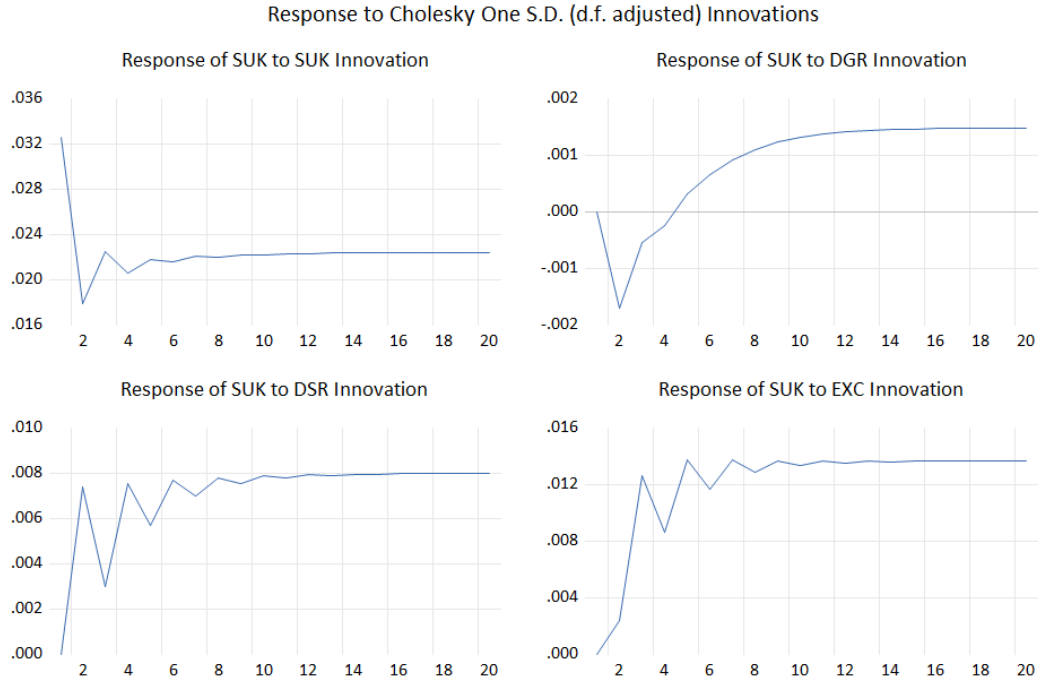


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Figure 2: Impulse response function

IRF provides an overview of the movement of the dependent variable due to the influence of changes (shock) from other variables. Figure 2 displays the duration of the influence of changes in another variable until the influence disappears or returns to the balance point. This function tracks the response of the dependent variable from other variables when it experiences a shock. The period taken in the IRF is only 20 periods since almost all responses of the dependent variable resulting from shocks to other variables in the 20th period or beyond have returned to the balance point.

The SUK response to shocks in the DSR will increase in the first two periods, decrease again in the next one period, and then increase again in the next one period. This shock repeats itself until the 14th period and reaches a balance point in the next 15th period. Notably, the SUK response to shocks in the EXC will increase slightly in the first three periods and increase sharply in the one period after, then decrease again slightly two periods later. This shock repeats itself until the 12th period and reaches a balance or stable point in the next period. This volatility suggests that shocks to the DSR and EXC will make the SUK unstable in the initial period of 2 to 3 years.

Variance Decomposition (VD)

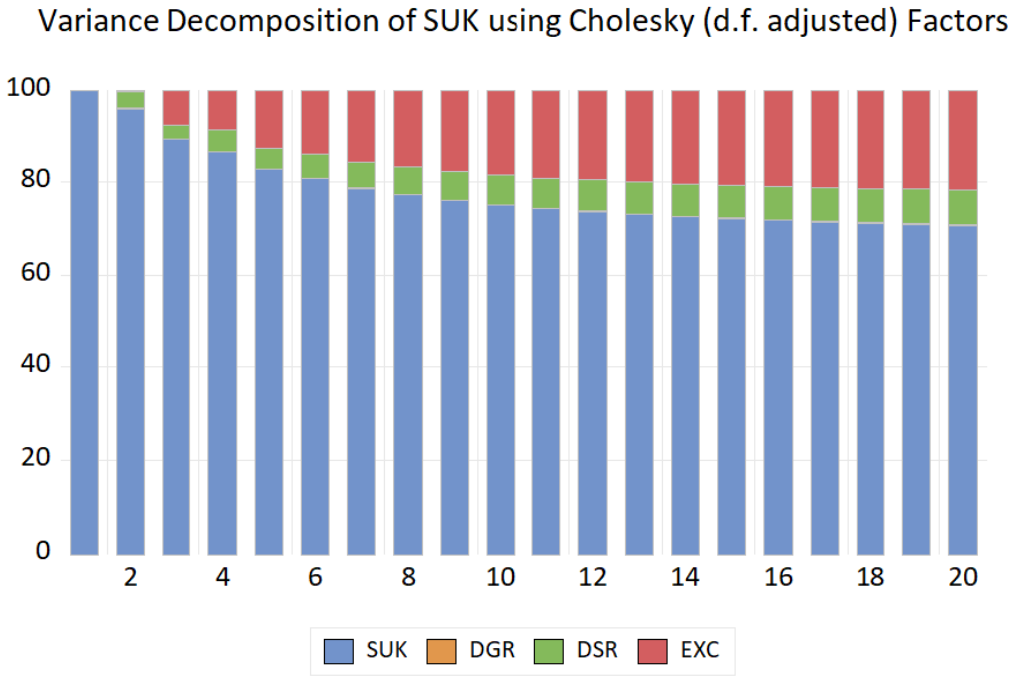

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Figure 3: Variance decomposition

VD analysis is used to observe the contribution of each variable to the dependent variable. This analysis also demonstrates the variance contribution of which variable is dominant in influencing the dependent variable. Figure 3 illustrates the results of the VD analysis where, in the first period, the dependent variable SUK is influenced by the SUK variable itself. Then, in the next period, DSR provides a fairly large contribution variance from the other independent variables. After that, in the next period, the EXC variable provides a larger contribution variance than the other independent variables. Furthermore, until the 20th period, the SUK contribution variance reduces to 0.70, and independent variables such as EXC and DSR provide a contribution variance of 0.21 and 0.07. In contrast, the DGR contribution variance does not greatly impact the SUK variable until the 20th period.

DISCUSSION

The effect of the foreign debt to GDP ratio (DGR) variable on long-term results has a positive and insignificant influence on developing the sovereign Sukuk market. Apart from that, research by Asri and Dwi Wulandari (2021) reveals that GDP negatively affects the development of the Sukuk market, which is in line with the assumption that foreign debt remains stable and does not increase. On the contrary, the results of this research aligned with Baita et al. (2023), which suggests that government public debt has a positive effect on the development of the sovereign Sukuk market in the case of OIC member countries. If foreign debt is increased to develop the sovereign Sukuk market, this will have a greater financial risk impact since foreign debt is very vulnerable to EXC volatility (Krugman et al., 2015).

The effect of the DSR variable on long-term results has a negative and significant influence on the development of the sovereign Sukuk market. The smaller the DSR, the higher the sovereign Sukuk market. Debt service stability is calculated using the ICRG database by Howell (2013), where the lower the DSR, the higher the debt service stability points. The results of this research aligned with the results of Boukhatem (2022), which suggested that debt service stability has a positive and significant effect on the development of the domestic Sukuk market in Saudi Arabia.

The DSR is considered an indicator of foreign debt burden as outlined by Sari and Ratno (2020). If principal and interest payments on debt increase relative to current transaction receipts, foreign exchange proceeds from exports will decrease and reduce the ability to pay debts or invest in the future. The opinion by Aman et al. (2019) stated that there is a significant relationship between the Sukuk market and the results of exports of goods and services. The conclusion is that the Sukuk market will develop in countries with open economies or trade. Suppose it is assumed that foreign debt payments are stable. In that case, the results of this research are in line with Ahmad and Muda (2013) and Al-Raeai et al. (2019), which demonstrate a positive and significant relationship between trade openness and the development of the Sukuk market.

The long-term effect results of the EXC variable on the sovereign Sukuk market demonstrate a positive and significant influence on long-term analysis, and this result is in line with (Ahmad & Muda, 2013; Al-Raeai et al., 2019; Asri & Dwi Wulandari, 2021; Billah et al., 2022; Boukhatem, 2022; Nafisah et al., 2020; Suriani et al., 2021) which indicates that there is a significant relationship between the EXC and the development of the Sukuk market.

Increased EXCs signify economic expansion and should be used as a guide when issuing new Sukuk (Nafisah et al., 2020). According to Billah et. Al. (2022), the EXC has a positive and significant effect on Sukuk volatility. However, the EXC also has a negative and significant effect on Sukuk returns. At the same time, research by Al-Raeai et. Al. (2019) also demonstrated a negative and significant influence on the development of the Sukuk market, and the results conclude that if the dollar increases, the rate of return on Sukuk will decrease.

Finally, based on the table above, the F-Statistic result is 3.66 (> 1.00), which suggests that, simultaneously, all independent variables have a significant effect on outstanding sovereign Sukuk. This concludes that financial risk has a significant effect on outstanding sovereign Sukuk. In addition, the R-Square result is 0.35, which reveals that this research model is able to explain 35% of the 100% total possibility of other variables explaining their influence on outstanding sovereign Sukuk.

CONCLUSION

The Indonesian government is dedicated in continuing to promote the growth of sovereign Sukuk since, in addition to serve as a financing tool for the State Revenue and Expenditure Budget (APBN), sovereign Sukuk issuance aims to provide investors with investment diversification. Macroeconomically speaking, comparing Sukuk's exceptional performance to that of other financial instruments can shed light on the special qualities and benefits of Sukuk (Boujlil et al., 2020). Hence, proper identification of financial risks related to the development of outstanding

sovereign Sukuk can produce suggestions for continuing to develop sovereign Sukuk in accordance with the risks involved.

Based on research conducted on financial risk variables for Indonesian sovereign Sukuk market development using the VECM method, this research analysis discovered several findings. To begin with, the DSR and EXC have a significant effect on the outstanding sovereign Sukuk. In contrast, the foreign debt to GDP ratio has no long-term or short-term effect, as evidenced by the VD results, which suggest that the foreign debt to GDP ratio has minimal contribution to outstanding sovereign Sukuk. The results of the IRF reveal how the shock of each variable affects the dependent variable and how unstable the outstanding sovereign Sukuk will be if there is a change or shock in the DSR and EXC variables. Furthermore, the results of the VD, indicating the contribution of each variable in influencing the dependent variable, suggest that the EXC and DSR make a large contribution to the outstanding sovereign Sukuk. Finally, the results of this study discovered that financial risk significantly affects outstanding sovereign Sukuk.

Suggestions for policyholders based on the findings of this research are that policyholders need to maintain the stability of the DSR indicator to remain low. Apart from that, EXC stability also needs to be considered with the aim that the development of the outstanding sovereign Sukuk market can remain at its current high level. Overall, financial risk needs to be a concern for regulators as its influence is one of the crucial roles in the development of sovereign Sukuk in Indonesia.

Investors can use the results of this research to analyze how the development of outstanding sovereign Sukuk is influenced by the DSR and the EXC since Sukuk is a long-term investment. Correspondingly, further research can utilise other financial risk variables or political risks to determine how they influence the development of the outstanding sovereign Sukuk market. In addition, developing the corporate Sukuk market or outstanding sovereign Sukuk in other countries can also be used to determine how Sukuk is affected by the same financial risks.

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