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Risk of Islamic securities (SUKUK) and a proposed reforms for development: the Indonesian experience

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ABSTRACT

This study investigates Sukuk risk analysis and its contribution to Indonesian development by analysing historical market data. Two separate analyses were conducted: first, Sukuk risk valuation using historical simulation, and second, calculating the relationship between Sukuk issuance and economic development. Sukuk data spans from October 2014 to March 2023, starting with PBS007 issuance. Economic data for analysis covers quarterly periods from 2010 to 2022. The VaR analysis results indicate that the risk level of Sukuk is competitive and dependent on factors like maturity and future economic conditions. Investors should consider these factors when evaluating Sukuk offerings. Understanding Sukuk characteristics and risk levels is crucial for balanced investment. ARDL analysis demonstrate that Sukuk, as an alternative development financing method contributes positive significantly to the macroeconomic landscape of Indonesia. Furthermore, our results also reveal that by utilising Sukuk financing, the country reduces its dependence on external parties to fulfil its economic requirements.

1. Introduction

Islamic securities or Sukuk activities have been growing rapidly in recent years. In the year 2023, the global Sukuk outstanding volume increased significantly to USD 765.3 billion, reflecting a notable rise of 7.6% compared to the previous year's figure of USD 751.6 billion (FitchRatings 2023). As for Indonesia, Sukuk has captured the attention of Muslim investors. Similar to conventional bonds, Sukuk not only offer appealing investment prospects but also serve as means for corporations and governments to raise funds (Bin-Nashwan and Muneeza 2021). Therefore, developing Sukuk is a way to mobilize financing and savings for a majority Muslim population country that would not be otherwise served by conventional financial institutions. Although the Sukuk market is one of the fastest-growing areas of Islamic finance, the growth of Sukuk originations is very low compared to the several trillion dollars each conventional bond market and the hedge fund market (Balli, Ghassan, and Al Jeefri 2021). This exorbitant growth raises many challenges, particularly in the areas of risk and profit returns

and innovation in terms of favourable regulatory developments at domestic and international levels (Setiawan 2022).

Despite a growing literature on Sukuk, there is very limited academic literature on Sukuk structures and their risk specific to the Indonesian experience. For example, the existing studies cover several issues on default risks of Sukuk and their rating in general (Smaoui et al. 2020a); Sukuk structures and pricing mechanisms (Razak, Saiti, and Dinç 2019); the correlation between Sukuk market development and the risk of bank insolvency (Smaoui, Mimouni, and Temimi 2020b); identifying of what drives *Sukuk* return and the risks for investors of bonds and Sukuk (Uddin et al. 2020). This study contributes to the existing body of literature by elucidating the risk and return exposure of Sukuk through historical simulation and quantifying the relationship between Sukuk and economic development in Indonesia. In principle, it is widely acknowledged that investors in Sukuk participate in both profits and losses, with the nominal value of their investment contingent upon the actual asset price. However, in practice, the allocation of profit may not consistently align with the capital contribution, varying in response to prevailing economic conditions, and can be lesser, equivalent, or even greater than the invested capital (Sial et al. 2022). Furthermore, previous studies revealed Sukuk holds promise as a secure refuge during periods of pronounced economic turmoil, displaying a negative or low correlation with conventional counterparts (Sifat et al. 2023). As articulated in this study, there is a noteworthy impetus to scrutinize the contemporary practices of Sukuk and systematically evaluate the attendant risk exposure borne by Sukuk holders. Uddin et al. (2020) assert that an empirical anomaly exists in the financial market, contending that Sukuk investors have not received commensurate compensation relative to the discernible level of risk inherent in Sukuk investments.

Moreover, the ongoing discussions surrounding the entry of Sukuk entities into the global market have been marked by a conflict stemming from differing interpretations among Muslim scholars. This discrepancy has led to confusion and difficulties in implementing the modern version of Islamic securities worldwide due to sharia uncertainty (Nyazee 2020). For example, sharia law prohibits the trading of debt contract to gain profit return, as the profit-taking without real economic activity is considered *riba,* which make many Sukuk is seen as indistinguishable to the interest system in conventional bonds (Hamzah et al. 2018). In some cases, the ambiguity of sharia surrounding the enforceability of contractual claims have eroded confidence in certain Sukuk within the market, dissuading potential investors (Razak, Saiti, and Dinç 2019). This is due to the fact that Sukuk does not offer a variable rate of return on investments and cannot guarantee the value of their assets, potentially influencing an investor's withdrawal decision (Smaoui, Mimouni, and Temimi 2020b).

Thus, building upon the aforementioned research motivations, this study responds to the critical discourse articulated by researchers such as Uddin et al. (2020), Smaoui, Mimouni, and Temimi (2020b), who contend that Sukuk holders are exposed to a heightened risk compared to bonds. Despite investors regarding Sukuk as a substitute for bonds, this study seeks to delineate the risk profile of Sukuk based on their return and maturity in the Indonesian market.

Given the pivotal role of Sukuk in Indonesia's development strategy, contributing significantly to the nation's economic growth and stability, this study further endeavours to

explore and analyses the impact of Sukuk on development in the Indonesian context. Emphasizing Sukuk's contribution to diversifying sources of financing, mitigating reliance on external entities, and fostering economic growth, this study seeks to provide a nuanced understanding of Sukuk's multifaceted influence on Indonesia's developmental landscape.

Research conducted on the relationship between Sukuk and economic growth in developing countries, including Indonesia, has shown positive and long-term associations. Studies by Ahmad et al. (2021), Muharam, Anwar, and Robiyanto (2019) have indicated that Sukuk issuance plays a beneficial role in driving economic movements in developing countries, with positive correlations observed between Sukuk and variables such as gross fixed capital formation and trade activities. Sukuk provides an alternative investment avenue for both domestic and foreign investors, offering attractive returns and an opportunity to participate directly in the country's development (Baita, Malami, and Al-Faryan 2023).

The sections of this study are structured as follows: Section 2 provides a comprehensive review of the contagion literature, offering a brief discussion on various risk profiles of Sukuk and conventional bonds, along with an examination of Sukuk's contribution to developments. Section 3 delineates the research methodology employed, accompanied by an elucidation of sample characteristics. In Section 4, we present and analyses the empirical findings derived from the study. The concluding insights are provided in the final section.

2. Literature review

The primary focus of this literature review lies in scrutinizing the return and risk dynamics of Sukuk within the Indonesian context, placing specific emphasis on the role of Sukuk issuance in fostering economic development. To achieve this, the review is structured as follows: Initially, we scrutinize studies of underlying risks associated with Sukuk, as pertinent to the focus of this investigation. Subsequently, we present studies that elucidate the distinctions in economic returns between Sukuk and conventional bonds. Lastly, we engage in a discourse on the developmental contributions of Sukuk.

2.1 Underlying dynamic risks of sukuk: misconceptions and flexibility

Sukuk is a type of investment that is esoteric and unfamiliar to many investors. *Sukuk* may be assumed by some investors as risky or illiquid due to its distinctive features and complexity in the structures as they are still newly established in the market. There is also a misconception that *Sukuk* is oil-dependent because its volatility tracks the rise and fall of the oil price. However, these assumptions can't be true, and a study suggests that *Sukuk* returns are more sensitive to global financial and macroeconomic conditions, and there are no correlations with oil prices (Naifar 2018).

Sukuk holders tend to hold the Sukuk even during periods of high volatility in the financial market and are not affected by the oil price fluctuation. This is due to the fact that, the majority of Sukuk bonds are shorter in duration, so that Sukuk is ready for the 'buy and hold' investor who holds for short periods and offers investors more

downside protection, especially when facing investors who may come in and out depending on market volatility (Kronfol 2017).

Given that sukuk does not establish a conventional lender – borrower relationship between holders and issuers, it introduces a level of flexibility for issuers to finance assets using sukuk proceeds. Simultaneously, sukuk holders assume ownership of the asset for a predetermined period. As per the contractual agreement, the issuer is obligated to share earnings derived from the asset with sukuk holders based on a mutually agreed-upon ratio. Consequently, the cash flow for a sukuk holder is contingent upon the performance of underlying assets invested in a business project. It follows that the performance of the sukuk market may inherently correlate with the profitability of these underlying assets (Uddin et al. 2020; Hossain, Uddin, and Kabir 2021; Rodoni and Setiawan 2019).

Hence, a primary contribution of our study involves Sukuk offerings that surpass deposit interest rates, adding depth to our analysis. This analysis is conducted via meticulous financial modelling aimed at assessing the inherent risks associated with sukuk at a predetermined expected return. It is noteworthy that previous research on sukuk has not extensively delved into this particular issue within the Indonesian context.

2.2 Sukuk structures and risk exposure of Indonesian sovereign Sukuk and conventional bonds

As mentioned earlier, the Sukuk holders technically do not share their profit and loss. Sukuk's risk and return characteristics are often similar to bonds depending on the *Sukuk* structure. In the case of Sukuk *wakalah* (agency contract), the agent selects and manages the underlying business or investment on behalf of the investor to ensure an agreed profit rate. However, if the profit earned from the business activities is more than the agreed rate, the agent can keep this excess profit. The *Sukuk* holders, on the other hand, retain their return based upon the agreed profit return (Radzi and Shaharuddin 2018; Razak, Saiti, and Dinç 2019). Several *Sukuk* have fixed the periodic returns and guaranteed the principal amount of the *Sukuk* holders. Razak, Saiti, and Dinç (2019), p. S24 mention that, 'In the case the actual profits realised were less than the promised returns, the originator provided funding, whereas when there were excess profits or surplus, the originator took it as an incentive'. Theoretically, there is no concept of fixed obligation, if sharia is to be adhered, the originators are not obliged to pay any amount to *Sukuk* holders when the losses occur or when there are no profits to be distributed.

In practical terms, Sukuk payment structures might resemble those of conventional bonds. However, a crucial distinction arises: conventional bonds involve interest accrual and represent straightforward debt for the issuer, a practice incompatible with Sharia principles. Consequently, the proceeds from bond issuances might fund non-Sharia-compliant activities, potentially supporting endeavours deemed *haram* (impermissible) (Abasimel 2023). A debt-type *Sukuk* provides fixed or determinable payments of profit and capital, while an equity-type *Sukuk* is a partnership type via a share of ownership which is similar to common share securities; the profit can be claimed if profits are earned after sharing in the risk of the project being funded (Radzi and Shaharuddin 2018).

Sukuk exhibits distinctions from conventional bonds, yet it can be characterized as a form of financial instrument positioned between equities and bonds (Abasimel 2023). The key reasons are; First, the payment of return in *Sukuk* resembles the interest system, where the periodic returns are fixed for the investors and the investors are not taking the risk that entitles to them. Second, the originators guarantee the principal amount of Sukuk holders, which is not in line with the ideal concept of profit-and-loss sharing (Radzi and Shaharuddin 2018). This underscores the rationale behind conventional bonds endeavouring to emulate sukuk by incorporating underlying assets, as the liquidity of bonds has been recognized as a pivotal financial determinant in volatility. A study conducted by Balli, Ghassan, and Al Jeefri (2021) concluded that the liquidity of bonds undergoes modification when a more current asset is affixed to the bond as a default security. This augmentation enhances bond liquidity by rendering the bond more marketable, as the attached asset bolsters its market appeal.

However, numerous studies have performed analysis to investigate an idealized sharia prescription of equity-based *Sukuk* structure and concluded that they might not be attractive to the investors in the modern capital market, particularly for investors who mainly expect capital gain and fixed income instruments as commonly featured in the conventional bond (Shafie et al. 2020). Purniaji and Sunarsih (2022) contend that investors are generally disinclined to assume ownership of assets and engage in the associated risks within the market. This reluctance stems from their preference for assured profitability without exposure to inherent risks. This paradox arises from the pressure of modern Islamic scholars to introduce the fixed return *Sukuk*, which resulted in the vast majority of *Sukuk* in the market structured similarly toward conventional bonds (Radzi and Shaharuddin 2018).

There are a remarkable number of scholars attempted to test differences in risk and return of sukuk compared to conventional bonds. Within the context of the Indonesian Sukuk market, notable findings indicate a lack of substantial distinctions between the two, given their analogous structures (Rodoni and Setiawan 2019). This similarity is evident in the payment of investors' returns, which is based on the floating floor rate. This rate is contingent upon the latest prevailing interest rate and is subject to a capped percentage ratio. The returns are disbursed monthly in the form of rewards and face value, continuing until the maturity of the Sukuk (Salsabilah, Habbe, and Nirwana 2021). This practice is in contrast from the findings of previous research by Hamzah et al. (2018); Mansor and Bhatti (2011), who assert that investors can derive earnings from the appreciation in the value of underlying assets, thereby introducing the possibility of Sukuk returns surpassing or falling below those of conventional bonds. Notably, while the findings of previous research focus on the investigation whether Sukuk carries additional risk due to its *raison d'etre* compliance with non-riba principles. This study augments to the current body of literature by providing a comprehensive examination of the risk exposure associated with Sukuk. It accomplishes this through the analysis of data pertaining to the risk of return on Indonesian sovereign Sukuk, concurrently addressing the correlation between economic indicators and the development of sovereign Sukuk.

2.3 Sukuk's market contribution to economic development

One of the challenges encountered by developing countries in their pursuit of development is the considerable burden of public debt, both domestically and internationally (Tawiah and Gyapong 2023). Sukuk emerges as a viable alternative to address this challenge, serving as a favourable avenue for governments to secure funding without accumulating public debt. This is attributed to the unique structure of sukuk, wherein ownership in an asset or business venture is conveyed to investors and returns emanate from the profits generated by the underlying asset (Razak, Saiti, and Dinç 2019).

In the case of Indonesia, there has been a gradual shift away from reliance on external debt towards the exploration of alternative sources for development financing. Since 2008, Sukuk issuance has gained substantial attention from the Indonesian government as a financing mechanism (Nisak 2022). In 2012, the government introduced a series of Project Based Sukuk (PBS) specifically designated for infrastructure projects within the national budget (APBN). Following to that period, Indonesia has witnessed a consistent escalation in both the frequency and quantum of sovereign Sukuk issuances (Pribadi 2020). This phenomenon underscores an emergent inclination within the nation towards the diversification of investment alternatives as a strategic imperative to augment economic growth and address infrastructural exigencies.

Numerous studies have investigated the role of the sukuk market in contributing to economic development in developing countries. Yıldırım, Yıldırım, and Diboglu (2020), for instance, explored the interplay between the Sukuk market, economic growth, and Islamic finance and banking systems in developing countries. Their research indicates a lasting correlation between the Sukuk market and economic growth. Similar findings were replicated in the study conducted by Abdelrahman (2019). However, Echchabi, Aziz, and Idriss (2018) present contrasting results, revealing that the issuance of Sukuk did not yield a significant impact on economic development in the Gulf Cooperation Council (GCC) countries. Consequently, this study endeavours to address this disparity and establish a discernible and positive relationship between Sukuk and development, substantiated by the observed economic growth in Indonesia.

3. Data and methodology

This study employs pertinent data for the utilized model, which includes government issued Sukuk and socio-economic indicators such as gross domestic product per capita (GDP), inflation, and gross capital formation (GCF). The government issued Sukuk data are Sharia State Treasury Bills with the following codes: PBS007, PBS011, PBS012, PBS015, PBS017, PBS018, PBS019, PBS020, PBS021, PBS022, PBS023, PBS024, PBS025, PBS026, PBS027, PBS028, PBS029, PBS030, PBS031, PBS032, PBS033, PBS034, PBS035, PBS036, PBS037. These Sukuk instruments possess varying time tenors ranging from 5 years to 46 years. The yield data represents a market risk factor that impacts the value and price of the Sukuk itself. The other relevant Sukuk-related data are the yield on the price of the Rupiah currency market with tenors of 1, 3, 6 months, and 1 year, in addition to the market price of Sukuk on the secondary market. Sukuk observations were collected from October 2014 to March 2023, starting from the issuance of PBS007 through PBS037. This dataset uses a comprehensive

period that allows for a thorough analysis of Sukuk performance and trends over time. On the other hand, economic data for econometric analysis was collected on a quarterly basis, covering the period from 2010 to 2022 are taken from World Bank Dataset (2023) and Statistic Indonesia (2023). This timeframe provides a sufficient range of economic data to examine the relationships between Sukuk and various economic indicators, allowing for a robust econometric analysis. The Sukuk trading book utilized in this study is based on data obtained from the Reuters terminal and the Indonesian stock exchange. This trading data is employed to measure market risk using an internal approach called Value at Risk (VaR). In the Sukuk data processing method, the present value data for each Sukuk is used, along with the correlation between yield volatility, return yield volatility, and vertex allocation.

In the next stage, the Sukuk data and other components of the dataset, comprising a time series, are tested for stationarity to avoid spurious correlations. The Augmented Dickey-Fuller (ADF) unit root test is employed to assess the stationarity of the data. Following this test, a normality test using the Jarque Bera method is conducted, which measures the skewness and kurtosis in the time series in relation to a normal distribution.

The analytical approach in this study consists of two parts. First, the risk analysis of Sukuk using the VaR method is performed. VaR is a technique that quantifies the maximum potential loss that may occur for a market instrument (Sukuk) within a specific period and at a certain level of confidence. It measures the risk of the largest downside within a particular period (one-tailed confidence interval). VaR is calculated using a historical simulation approach, which relies on historical time series data to represent market movements.

The methodology of historical simulation VaR involves four stages: compiling historical changes in risk factors, calculating portfolio value changes for each historical change, sorting portfolio value changes, and ultimately computing the VaR value. The historical simulation method treats changes in market conditions from today to tomorrow as equivalent to changes that have occurred in the past, using the historical distribution of asset returns within a portfolio to simulate and derive the VaR value.

Second, econometric calculations are conducted using the adapted production function proposed by Akram (2011), Ali and Mustafa (2012), which emphasizes the significant role of the cost of debt and its implications for capital and labour productivity. This research aligns with previous studies conducted by Yıldırım, Yıldırım, and Diboglu (2020), which investigated the relationship between Sukuk and their impact on development. The equation can be expressed as follows:

$$Y_{it} = \delta_0 \rho_i + \delta_1 Sukuk_{it} + \delta_2 X_{it} + e_{it}$$

where Y represents economic growth per capita measured in US dollars at 2010 prices. *Sukuk* Sukuk refers to two variables, namely the total Sukuk issued within the research sample (*NS*) and the total value of Sukuk issued (*VS*). Additionally, the control variable X includes factors such as inflation and investment and the error term is denoted as *e*. To mitigate potential regression biases, all data is transformed using natural logarithms.

Table 1 presents an array of economic variables derived from Indonesian institutions within the specified study timeframe. This encompasses Sukuk issuances by the government sourced from records maintained by entities such as OJK and BI. Moreover, the

Table 1. Data description.

Variables	Source	Description
Sukuk (*NS* and *VS*)	OJK, BI	The number of Sukuk issued by the Indonesian government during the study period.
GDP (Y)	WDI	Growth Per capita (2010 US dollars)
Inflation (*INF*)	BPS	Consumer price index
Investment (*GCF*)	WDI	Gross fixed capital formation (GFCF) as ratio of GDP

Notes: OJK means Otoritas Jasa Keuangan (Financial services authority), BI means Bank of Indonesia, BPS means Badan Statistic Indonesia (2023) and WDI is World Development Indicators from World Bank dataset (2023). Source: Adapted from FSA's Roadmap book, Financial Service Authority (2023).

dataset includes GDP growth per capita obtained from the World Development Indicators (WDI) and inflation measurements determined by the Consumer Price Index sourced from the Indonesian Central Statistics Agency (BPS).

The analysis, as outlined in Equation (1), employs several steps. Firstly, a unit root test is conducted to evaluate the stationarity of the variables. Secondly, the autoregressive distributed lag (ARDL) model, following the approach introduced by Kripfganz and Schneider (2016), Suwandaru, Rooswidjajani, and Brimantyo (2022), is employed to investigate the existence of cointegration among the variables. The equation for the ARDL model is as follows:

$$\Delta Y_t = \rho_0 + \rho_1 Y_{t-1} + \rho_2 Sukuk_{t-1} + \rho_3 X_{t-1} + \sum_{i=1}^{p} \delta_i \Delta Y_{t-i} + \sum_{i=1}^{p} \vartheta_i \Delta Sukuk_{t-i}$$

$$+ \sum_{i=1}^{p} \gamma_i \Delta X_{t-i} + \varepsilon_t \tag{1}$$

In the equation, ρ_0 represents the intercept, and ε_t denotes the error term. The coefficients ρ_1, ρ_2, and ρ_3 correspond to the long-run coefficients. The ARDL model allows for the examination of both the long-run and short-run dynamics of the employed model. This analysis addresses the issue of simultaneity between variables and addresses residual and endogeneity problems. Additionally, a cointegration test is conducted to determine whether the model exhibits a long-term relationship. Following the methodology proposed by Kripfganz and Schneider (2016), the cointegration test can be conducted using the Wald test by comparing the F-statistic to critical values in the upper and lower bounds.

4. Result and discussion

This study aims to contribute to enhancing competition in the global Sukuk market by employing financial modelling to assess the risk associated with Sukuk at a given expected return. Through this analysis, it endeavours to boost market efficiency by providing insights into risk-return dynamics, aiding investors in making informed decisions. By evaluating the risk linked to Sukuk issuance concerning expected returns, this research seeks to foster transparency and confidence in these instruments. Additionally, by shedding light on risk assessment methodologies, it supports the development of standardized practices within the Sukuk market, potentially attracting more participants, including issuers and investors. Ultimately, this initiative aligns with the broader goal of utilizing Sukuk as an effective tool for funding developmental projects, infrastructure,

and initiatives crucial for the nation's economic growth and stability (Yıldırım, Yıldırım, and Diboglu 2020).

Our results reveal some novel findings. Sovereign Sukuk backed by the Indonesian government carry specific risks while significantly contributing to the nation's development. These securities carry market risks that are impacted by fluctuations in interest rates and investor sentiment, influencing their value and appeal. Despite their perceived lower risk due to government backing, sovereign Sukuk still bear credit risks, contingent upon the government's financial stability and ability to meet obligations. Liquidity risks may emerge from market disruptions, impacting the ease of buying or selling these instruments, while regulatory or political changes can influence investor confidence or Sukuk terms.

Nevertheless, sovereign Sukuk play a crucial role in funding Indonesia's development, often financing critical infrastructure projects and vital initiatives that bolster economic growth. Our analysis further reveals that Sukuk issuance injects liquidity into the economy, fostering growth and creating employment opportunities, thereby contributing to economic stability. This may be due to the fact that, diversifying funding sources through Sukuk issuance attracts a broader base of domestic and international investors, showcasing the government's credibility and commitment to financial transparency. Finally, successful sovereign Sukuk issuance enhances investor confidence, attracting further investments, and fostering an environment conducive to sustainable economic development, as anticipated.

The number of Sukuk issuances and their volume has consistently increased in Indonesia, reflecting a growing trend in diversifying investment options in countries with a significant Muslim population (Statistic of Indonesia 2023). The management of outstanding Sukuk is guided by Sharia-based principles, making them an attractive investment avenue for those seeking Sharia-compliant investments. Sukuk also offer interest rates that surpass deposit interest rates.

This study not only establishes a significant and positive correlation between Sukuk and developmental progress but also demonstrates this link through the observed economic growth in Indonesia. Figures 1 and 2 vividly depict the consistent annual escalation in Sukuk volume and capitalization, portraying an upward trajectory that has captured the attention of a myriad of investors. Utilizing these figures, we conduct a thorough analysis of Sukuk utilizing the VaR approach to gauge its market risk.

Moreover, the sheer size of the Sukuk market undeniably acts as a pivotal driving force in the economy, delivering substantial benefits to both investors and issuers alike. This study encompasses additional variables such as gross capital formation and inflation, integrating them into an extensive econometric analysis to comprehensively assess the profound impact of Sukuk on economic development. Through this comprehensive approach, we aim to provide a holistic understanding of the intricate relationship between Sukuk instruments and the sustainable advancement of Indonesia's economy.

An insightful analysis of Table 2 reveals an intriguing trend among the 24 types of Sukuk: a uniform distribution of kurtosis and skewness across all variants. This uniformity implies a balanced and dynamic level of volatility among Sukuk types, showcasing a noteworthy stability within this diverse financial landscape. Such consistency in volatility distribution underscores the profound impact of adept governmental management strategies. These strategies, coupled with the alignment of interest rates to suit prevailing
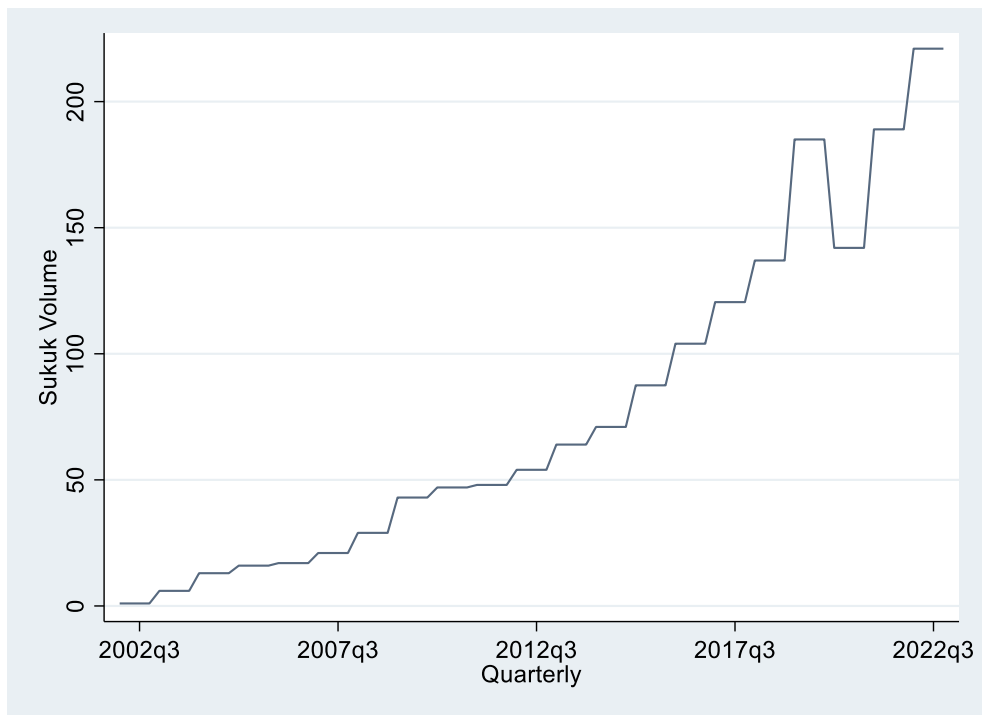
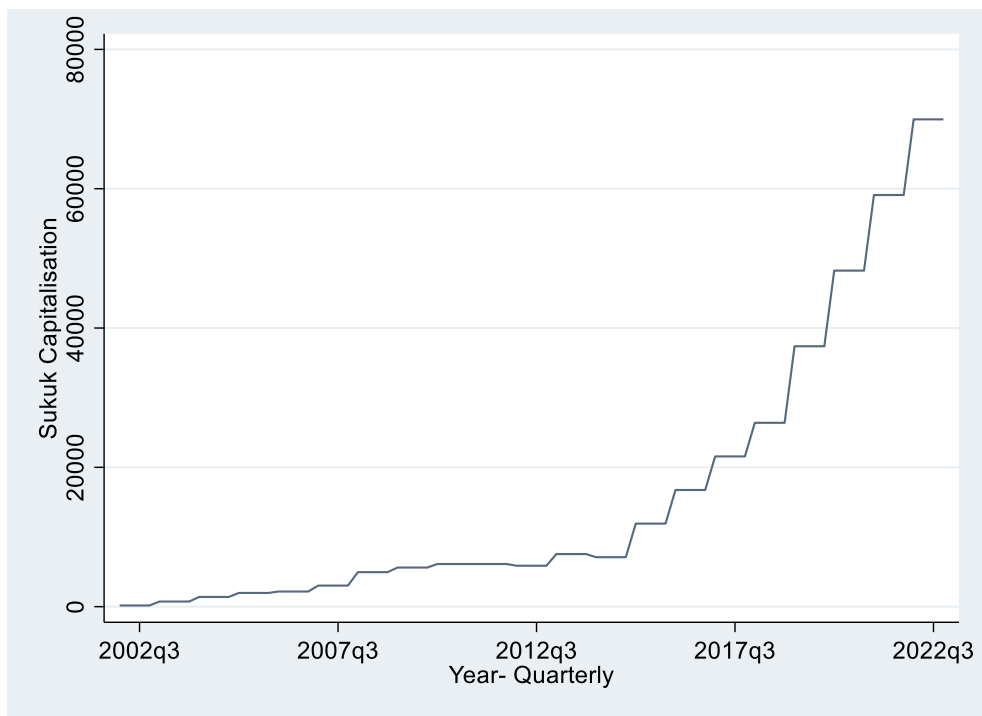**Figure 1.** The growth of Sukuk volume in Indonesia.

Figure 2. Sukuk capitalization in Indonesia.

Table 2. VaR results.

Sukuk	Issue	Yield	Maturity	Kurtosis	Skewness	VaR	CL
PBS007	Oct-14	9	25	4.3	0.23	183.04	0.05
PBS011	Jan-16	8.75	7	4.14	0.21	172.3	0.05
PBS012	Jan-16	8.875	15	4.55	0.2	180.23	0.05
PBS015	Jul-17	8	30	4	1.2	179.22	0.05
PBS017	Jan-18	6.125	7	2.5	0.34	130.34	0.05
PBS018	Jun-18	7.625	10	2.3	0.29	143.3	0.05
PBS019	Oct-18	8.25	5	3.1	0.31	191.78	0.05
PBS020	Oct-18	9	9	3.9	0.41	197.74	0.05
PBS021	Dec-18	8.5	8	4	0.46	230.4	0.05
PBS022	Jan-19	8.625	35	3.1	0.23	180.98	0.05
PBS023	May-19	8.125	10	3.7	0.41	190.39	0.05
PBS024	May-19	8.375	13	3	0.5	187.31	0.05
PBS025	May-19	8.375	14	2.9	0.517	179.4	0.05
PBS026	Oct-19	6.625	5	3.7	0.531	140.4	0.05
PBS028	Jul-20	7.75	46	3	0.545	182.2	0.05
PBS029	Jan-21	6.375	33	2.9	0.559	172.91	0.05
PBS030	Jun-21	5.875	27	2.5	0.573	164.2	0.05
PBS031	Jul-21	4	3	2	0.587	125.34	0.05
PBS032	Jul-21	4.875	5	2.2	0.601	132.86	0.05
PBS033	Jan-22	6.75	25	3	0.615	160.21	0.05
PBS034	Jan-22	6.5	17	2.83	0.629	172.3	0.05
PBS035	Mar-22	6.75	25	2.7	0.643	140.35	0.05
PBS036	Aug-22	5.375	3	3	0.656	162.3	0.05
PBS037	Jan-23	6.875	10	3.2	0.670	169.91	0.05

Note: All calculations pertaining to each Sukuk are conducted with a confidence level (CL) of 95%. This utilization of a specific confidence level enables the facilitation of risk value comparisons across the Sukuk offerings.

economic conditions and varying maturity periods, stand as instrumental forces shaping the trajectory of Sukuk volatility over time.

It is imperative to underscore that while each Sukuk type boasts a clearly defined designation and governmental backing, the observed volatility remains significantly subject to the maturity profile and the ever-evolving economic milieu. This nuanced interaction between distinct factors underscores the intricacies surrounding Sukuk dynamics, necessitating a comprehensive comprehension of the market forces at play. By acknowledging this complex nature of Sukuk volatility, a deeper understanding emerges of the intricate relationship between government policies, economic landscapes, and the resultant fluctuations witnessed within these financial instruments.

Furthermore, this observation unveils the necessity for a holistic approach to evaluate Sukuk behaviour comprehensively. A nuanced exploration of these variables not only elucidates the dynamic nature of Sukuk but also empowers stakeholders to navigate and anticipate market movements with greater acumen. As a result, such insights hold substantial promise in bolstering decision-making processes and formulating strategic initiatives tailored to ensure a more resilient and adaptable Sukuk market.

A comprehensive examination of the VaR values can be seen in Table 2, unravels a mosaic of intricate risk dynamics characterizing various Sukuk types. This exhaustive scrutiny unveils a discernible pattern, intricately linking escalated interest rates and protracted maturity periods to a proportional elevation in VaR values across individual Sukuk variants. Amidst this detailed scrutiny, the spotlight shines brightly on PBS019, PBS020, and PBS023, distinguished by their marked prominence in the VaR spectrum, registering significantly elevated values of 191.78, 197.74, and 190.39, respectively. These remarkable peaks in VaR values result from an interplay of contributing factors.

They include moderately prolonged maturity periods, relatively heightened interest rates, and a backdrop of sustained stability ingrained within the economic milieu.

The observed correlations between these variables underscore the nuanced intricacies underscoring the risk assessment landscape of Sukuk. This comprehensive analysis not only sheds light on the intricate web of factors influencing VaR but also accentuates the need for a holistic understanding of these variables. Such insights hold substantial implications for stakeholders, empowering them to navigate the dynamic landscape of Sukuk investments while devising astute risk management strategies tailored to prevailing market conditions.

Taking a broader perspective, the results of the VaR analysis support the conclusion that the risk level of Sukuk is highly competitive and contingent upon various factors, including the maturity level and future economic conditions. The findings indicate that investors and market participants should carefully consider these factors when assessing the risk associated with different Sukuk offerings. By doing so, they can make informed investment decisions that align with their risk preferences and investment objectives. Overall, the analysis highlights the importance of understanding the relationship between Sukuk characteristics, such as maturity and interest rates, and their corresponding risk levels to ensure a well-informed and balanced investment approach.

The next stage is to examine how Sukuk affects development in the Indonesian setting. Table 3 provides the summary statistics which offer valuable insights into the distribution and characteristics of the variables under analysis. The number of observations for each variable is consistent, with 84 observations available. The mean represents the average value of the variable across the observations. For instance, the mean of Y is approximately 8.119409, indicating the average value of this economic indicator. Then, the standard deviation of Y is approximately 0.2397829, indicating the spread of values around the mean. A higher standard deviation signifies a broader spread of data points from the average, indicating a more extensive variability within the dataset. Conversely, a lower standard deviation suggests a narrower distribution, signifying greater proximity of data points to the mean. This statistical parameter thus serves as a crucial indicator of the degree of variability exhibited by Y, providing essential insights into the dataset's dispersion and the degree of deviation from its average value.

Table 4 illustrates the values in the matrix represent correlation coefficients, which indicate the strength and direction of the linear relationship between two variables. The correlation coefficient ranges from −1 to 1. Analysing the matrix, we observe the following correlations: Y is strongly positively correlated with VS (0.9385), NS (0.8264), and moderately positively correlated with GCF (0.6633). The variable VS is strongly positively correlated with NS (0.9413) and moderately positively correlated with GCF (0.5184). Additionally, NS shows a moderate positive correlation with GCF (0.3909). On the

Table 3. Descriptive statistics.

Variable	Obs	Mean	Std. dev.	Min	Max
Y	84	8.12	0.24	7.72	8.49
NS	84	76.95	64.68	1.00	221.00
VS	84	16388.98	20059.31	175.00	69960.00
GCF	84	27.65	0.64	25.28	28.00
INF	84	1.90	0.29	1.45	2.57

Table 4. Correlation matrix for the variables.

	Y	VS	NS	GCF	INF
Y	1				
VS	0.9385	1			
NS	0.8264	0.9413	1		
GCF	0.6633	0.5184	0.3909	1	
INF	−0.4413	−0.3269	−0.216	−0.3631	1

other hand, *INF* has weak negative correlations with *Y* (−0.4413), *VS* (−0.3269), *NS* (−0.2160), and *GCF* (−0.3631). These correlation coefficients provide insights into the relationships between the variables, indicating their degree of association.

The next step in this study involved conducting a preliminary assessment by performing an Augmented Dickey-Fuller unit root test on the variables, considering both intercept and trend terms. The results of this test, as shown in Table 5, indicate that the variables exhibit stationarity at various levels. Specifically, the variables *GCF* and *INF* are found to be stationary at the level, while the variables *Y, NS*, and *VS* are stationary at the first difference. In summary, the findings of the preliminary assessment reveal that the examined variables possess stationarity characteristics at different levels and confirm the presence of a long-term relationship within the utilized model. These results provide a solid foundation for further analysis and exploration of the relationships between the variables in the context of the study.

To further clarify the model's dynamics and explore the potential existence of a consistent relationship among the variables, an extensive cointegration test was carried out, and the resulting outcomes were detailed in Table 6. The resulting F-statistic, a notable 10.452, significantly surpasses the critical values across all levels of significance. This compelling statistical evidence unequivocally indicates the presence of cointegration among the variables under examination. Hence, this robust finding strongly suggests the establishment of a lasting and substantial long-term relationship within the model utilized in this study.

The detailed cointegration test showcased in Table 6 has unveiled a robust and enduring long-term relationship deeply ingrained within the model under examination. This resolute stability finds compelling substantiation through the discernible presence of a negative, indicating a downward trend, and statistically significant error correction coefficient. This pivotal coefficient, recognized as the Error Correction Term (ECT), serves as an illuminating guidepost illuminating the pace at which deviations from the unrestrained model expeditiously reconcile towards their steadfast long-term equilibrium.

Table 5. Augmented Dickey – Fuller Unit Root Test results.

	Level		First difference	
Variables	Intercept	Trend	Intercept	Trend
Y	−0.852	−2.376	−38.166***	−41.426
NS	4.761	1.702	−6.621***	−11.552***
VS	0.874	−1.749	−5.882***	−6.153***
GCF	−2.547	−3.864**	−5.037***	−5.005***
INF	−3.622	−3.738**	−5.057***	−5.070***

Notes: ** and *** are 5% and 1% significance level, respectively.

Table 6. Wald's cointegration test.

Wald F-statistic	10%		5%		1%	
	Lower Bound I (0)	Upper Bound I (1)	Lower Bound I (0)	Upper Bound I (1)	Lower Bound I (0)	Upper Bound I (1)
10.452***	2.26	2.62	3.23	3.79	3.41	4.68

Note: *** represents 1% level of significance.

The computed ECT value of 2.496% serves as a pivotal metric, spotlighting the remarkable agility of this model in swiftly restoring equilibrium. Notably, this figure signifies a restoration of balance within an astonishingly concise timeframe of merely one year after any perturbations or adjustments to the long-term status quo. This insightful revelation accentuates the model's resilience and inherent ability to autonomously correct deviations, facilitating a rapid return to a state of equilibrium, thus fortifying its stability and reliability in capturing the underlying long-term relationships among the variables under examination.

Moreover, the comprehensive insights unveiled in Table 7, stemming from the detailed ARDL analysis, offer substantial and supplementary evidence, further bolstering the assertion regarding the affirmative influence of Sukuk issuance on fostering long-term economic growth. The discernible positivity emanating from the coefficients associated with the accrued market value and volume of Sukuk elegantly accentuates a

Table 7. ARDL results.

Variable	Coeffient	Std. Err.	t-stats	[95% Conf.	Interval]
ECT	−0.02496***	0.010719	−2.33	−0.04649	−0.00343
Long Run					
VS	0.00154**	0.003145	−0.49	−0.00786	0.004778
NS	3.00E-06*	4.63E-06	−0.65	−1.2E-05	6.31E-06
GCF	0.419071***	0.149067	2.81	0.119661	0.71848
INF	0.276856	0.177521	1.56	−0.07971	0.633418
Short Run					
ΔGCF	0.00459***	0.00126	−3.64	−0.00712	−0.00206
ΔGCF (−1)	0.0047***	0.001252	−3.75	−0.00721	−0.00218
ΔGCF (−2)	0.0047***	0.001252	−3.75	−0.00721	−0.00218
ΔGCF (−3)	0.0047***	0.001252	−3.75	−0.00721	−0.00218
ΔVS	1.48E-05	5.24E-05	0.28	−9E-05	0.00012
ΔVS (−1)	5.78E-06	5.24E-05	0.11	−1E-04	0.000111
ΔVS (−2)	5.78E-06	5.24E-05	0.11	−1E-04	0.000111
ΔVS (−3)	5.78E-06	5.24E-05	0.11	−1E-04	0.000111
ΔNS	−5.46E-08	3.43E-07	−0.16	−7.44E-07	6.35E-07
ΔNS (−1)	−1.25E-07	3.43E-07	−0.36	−8.14E-07	5.64E-07
ΔNS (−2)	−1.25E-07	3.43E-07	−0.36	−8.14E-07	5.64E-07
ΔNS (−3)	−1.25E-07	3.43E-07	−0.36	−8.14E-07	5.64E-07
ΔINF	−0.00359	0.003035	−1.18	−0.00969	0.002504
ΔINF (−1)	−0.00359	0.003035	−1.18	−0.00969	0.002505
ΔINF (−2)	−0.00359	0.003035	−1.18	−0.00969	0.002505
ΔINF (−3)	−0.00359	0.003035	−1.18	−0.00969	0.002505
Constant	0.006311	0.070342	0.09	−0.13497	0.147597
R squared		0.9801			
Adj R Sq		0.9686			
Breusch-Godfrey LM		49.559			
White test		0.2424			
Durbin-Watson		0.4904			
JB		0.674			

Notes: *** and ** represent 1% and 5% significance levels.

favourable and constructive relationship. Crucially, this affirmative correlation extends its salience into the short-term dynamics as well, amplifying the credibility of Sukuk as a potent catalyst in economic growth.

The findings obtained from this thorough investigation unquestionably emphasize the crucial impact of alternative funding methods, particularly Sukuk, in notably boosting the Indonesian economy. Sukuk financing emerges as a strategic avenue adept at mitigating the country's reliance on external sources, seamlessly meeting its economic requisites through indigenous channels. The government's strategic utilization of Sukuk issuance for developmental endeavours presents an array of advantageous prospects.

Primarily, it facilitates an expedient and accessible avenue for the government to procure funds promptly and efficiently, enabling the implementation of pivotal developmental initiatives with relative ease. Secondly, this strategic approach curtails reliance on foreign entities, resulting in a pivot towards a more internally driven economic framework. This transition, where a substantial portion of the state's debt portfolio becomes domestically sourced rather than externally reliant, significantly bolsters the national economy's resilience and stability.

In addition to these tangible benefits, Sukuk investments present an alluring prospect for investors, particularly through instruments offering yields surpassing prevailing inflation rates. This not only diversifies investment portfolios but also offers an attractive avenue for capital appreciation. Lastly, Sukuk plays a democratizing role, empowering the public to actively partake in the country's developmental trajectory by participating in Sukuk investments, thereby fostering a sense of collective participation and ownership in national progress.

The variable denoting gross fixed capital formation showcases a consistently positive relationship with economic growth, affirming its pivotal role in fostering both long-term sustainability and short-term spurts in economic activity. This robust finding underscores the paramount importance of investments, particularly within productive sectors, in propelling and sustaining economic dynamism. The discernible correlation elucidates those substantial investments, notably channelled into sectors geared for productivity enhancement, serve as critical catalysts in invigorating overall economic performance.

The model's reliability and trustworthiness were confirmed through a comprehensive and precise implementation of a set of diagnostic tests. The outcomes of the Breusch–Godfrey LM test notably point towards the presence of serial correlation among the variables, accentuating the need for addressing this correlation to enhance the model's precision. Despite this observation, the results gleaned from the Jarque Bera test offer reassuring evidence, confirming that the data employed in the analysis conform to a normal distribution pattern. This validation bolsters the confidence in the data's reliability, affirming its suitability for statistical modelling and analysis.

In essence, these findings not only underscore the significance of investments in propelling economic growth but also highlight the critical need for addressing the identified serial correlation to refine and fortify the model's accuracy. Moreover, the affirmation of the data's normal distribution patterns cements the foundation for robust statistical analyses, consolidating the reliability and validity of the findings derived from this comprehensive economic assessment.

5. Conclusion

The objective of this research is to delve into the risk of Sukuk by analysing its historical market records and explore its contribution to the economic development of Indonesia. The study employs two distinct analyses to achieve these goals. The first analysis focuses on assessing the VaR of Sukuk using historical simulation, while the second analysis examines the relationship between Sukuk and development.

The insights derived from the VaR analysis provide an illuminating perspective on the intricate risk landscape inherent in Sukuk investments. This comprehensive analysis vividly exposes the complex interaction of factors shaping the risk profiles, prominently influenced by diverse elements including but not limited to maturity levels and anticipated future economic conditions. This evolving disclosure underscores the crucial need for careful examination by investors and market participants when evaluating different Sukuk proposals.

In this competitive terrain, the prudent evaluation of these contributing factors becomes an indispensable exercise for stakeholders. The judicious assessment of maturity periods, coupled with astute anticipation of prospective economic scenarios, emerges as pivotal facets guiding investment decisions. By adeptly navigating and weighing these crucial factors, investors can craft a discerning and informed strategy that aligns seamlessly with their risk appetite and investment objectives.

The crux lies in the astute discernment of these elements. Careful consideration of maturity profiles and comprehensive analysis of anticipated economic trajectories empower investors to calibrate their risk exposure intelligently. This enables them to tailor their investment portfolios in accordance with their risk tolerance levels and overarching investment goals.

Ultimately, this thoughtful evaluation process not only enhances the investment decision-making framework but also offers investors a strategic advantage in navigating the dynamic landscape of Sukuk investments. By holistically appraising the risk dimensions associated with Sukuk offerings, investors pave the way for prudent and well-informed investment choices that harmonize with their risk preferences and financial aspirations.

Embarking on the comprehensive ARDL analysis, the findings yield robust evidence, further corroborating Sukuk issuance as a catalyst for fostering long-term economic growth. The coefficients linked to the accumulated market value and volume of Sukuk echo a persistently favourable correlation, solidifying Sukuk's pivotal role in steering economic development. This substantiation emphasizes the instrumental contributions of Sukuk and underscores its substantial impact on driving sustained economic progression.

The resonance of this positive relationship transcends mere long-term prospects, resonating profoundly in the immediate economic landscape. The reiterated affirmation of this correlation, even in the short term, accentuates the tangible and swift benefits derived from Sukuk issuance. This underscores the dual nature of Sukuk's impact – while being an agent of enduring growth, it also heralds immediate positive economic impulses.

These insightful revelations gleaned from the ARDL analysis paint a vivid canvas of Sukuk's impact on economic development. They underscore Sukuk's versatility and

efficacy as a financial instrument, serving not only as a catalyst for sustained economic growth but also as an immediate driver of positive economic change. Such multifarious influence positions Sukuk as an indispensable and dynamic tool, wielding significant influence in fostering Indonesia's economic prosperity and cementing its role as an integral element within the nation's economic development paradigm.

Additionally, the study explores the relationship between gross fixed capital formation and economic growth. The results indicate a positive association between these variables, emphasizing the importance of investment, particularly in productive sectors, in stimulating economic activity. This implies that Sukuk, as an alternative financing method, not only contributes to economic development but also encourages investment in sectors that drive sustainable growth.

Contributing to the existing body of literature on Sukuk or debt securities, this study offers significant insights that enhance the comprehension of Sukuk's role within financial markets. Through an examination of Sukuk issuance's impact on economic growth, this research substantially augments the understanding of Sukuk's efficacy as a financial instrument. The identified positive correlations between Sukuk issuance and long-term economic growth not only validate but also extend the current knowledge, illuminating the dynamic role Sukuk plays in stimulating economic development.

The detailed analysis in this study serves to fill gaps in the literature, particularly in understanding the complex relationships between Sukuk and economic growth dynamics over varying timeframes. The findings unearthed in this research provide empirical evidence that strengthens and expands the existing theoretical frameworks concerning the role of Sukuk within financial markets.

This study's emphasis on the immediate benefits derived from Sukuk issuance enriches the literature by offering nuanced insights into Sukuk's dual impact – not only as a driver of long-term sustainable growth but also as a catalyst for immediate economic impetus. Such revelations significantly enhance the breadth and depth of literature on Sukuk's influence within financial ecosystems.

By highlighting Sukuk's importance in reducing reliance on external funding sources and promoting domestic economic stability, this study accentuates a critical dimension that advances the understanding of Sukuk within broader economic contexts. This distinct contribution underscores Sukuk's pivotal role in steering a nation's economic trajectory towards self-sufficiency and resilience against external economic shocks. This study stands as a valuable addition to the literature on Sukuk or debt securities, affirming existing knowledge and broadening the discourse to illustrate the dynamic role that Sukuk plays within financial markets and in shaping economic landscapes.

5.1. Policy recommendation

This research will serve as an insight for the policy makers in the economic development. Our finding highlights the competitive risk profile of Sukuk and its dependence on various factors. It emphasizes the need for thorough evaluation when considering Sukuk investments. Furthermore, the study reaffirms the positive impact of Sukuk issuance on long-term economic growth and underscores the significance of investment in driving economic development. The results from this study suggest the possible policy recommendations for stimulating the investor to invest in the sovereign Sukuk as it

promotes the country sustainable economic growth and development. Overall, the findings underscore the pivotal role of Sukuk as a financing instrument and its potential to contribute to the advancement of Indonesia's economy.

5.2. Limitations and future research

The limitation of this study is that it did not consider the comparative differences between the Sukuk in Indonesia and other countries. A comparative work in other jurisdictions will further enhance the insight into which the Sukuk works for economic development in different territories. Future research relating to countries where Sukuk is adopted such as Malaysia, and the Gulf countries may be imperative and attract more attention that can contribute to sustainable development from cross-border experiences.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

Abasimel, N. 2023. Islamic banking and economics: concepts and instruments, features, advantages, differences from conventional banks, and contributions to economic growth. *Journal of the Knowledge Economy* 14: 1923–1950.

Abdelrahman, A.Y. 2019. Sukuk: a critique of experience, and their possible role in Muslim countries development. *International Journal of Islamic Economics and Finance Studies* 5: 1–19.

Ahmad, N., A. Rahman, S. Rahim, and N. Azzan. 2021. Macroeconomic indicators and Sukuk market performance in selected OIC. *Economies Tazkia Islamic Finance and Business Review* 15: 1–22.

Akram, N. 2011. Impact of public debt on the economic growth of Pakistan. *The Pakistan Development Review* 50: 599–615.

Ali, R., and U. Mustafa. 2012. External debt accumulation and its impact on economic growth in Pakistan. *The Pakistan Development Review* 51: 79–95.

Baita, A., H. Malami, and M. Al-Faryan. 2023. Fiscal policy and Sukuk market development in OIC countries. *Journal of Islamic Accounting and Business Research* 14 (8): 1216–1231.

Balli, F., H. Ghassan, and E.H. Al Jeefri. 2021. Sukuk and bond spreads. *Journal of Economics and Finance* 45: 529–543.

Bin-Nashwan, S., and A. Muneeza. 2021. Investment decisions in digital Sukuk in the time of COVID-19: do tax incentives matter? *Journal of Sustainable Finance and Investment* 13: 589–613.

Echchabi, A., H.A. Aziz, and U. Idriss. 2018. The impact of Sukuk financing on economic growth: the case of GCC countries. *International Journal of Financial Services Management* 9: 60–69.

Financial Services Authority. 2023. *Roadmap Pengembangan dan Penguatan Perbankan Syariah Indonesia 2023-2027*. Jakarta: Otoritas Jasa Keuangan Republik Indonesia.

FitchRatings. 2023. Global Sukuk outlook dashboard: 2023. *Fith Ratings.* Dubai: Fitch Ratings, Inc.

Hamzah, S.R., O. Ismath Bacha, A. Mirakhor, and N. Abdul Kader Malim. 2018. Empirical evidence of risk shifting in bonds and debt-based Sukuk: the case of Malaysian corporations. *Journal of Islamic Accounting and Business Research* 9: 687–700.

Hossain, M.S., M.H. Uddin, and S.H. Kabir. 2021. Sukuk and bond puzzle: an analysis with characteristics matched portfolios. *Emerging Markets Finance and Trade* 57: 3792–3817.

Kripfganz, S., and D. C. Schneider. 2016. ardl: stata module to estimate autoregressive distributed lag models. Stata Conference, Chicago.

Kronfol, M. 2017. Debunking the myth about global Sukuk. *Shariah Quarterly*. Dubai: Franklin Templeton Investments.

Mansor, F., and M.I. Bhatti. 2011. Risk and return analysis on performance of the Islamic mutual funds: evidence from Malaysia. *Global Economy and Finance Journal* 4: 19–31.

Muharam, H., R. Anwar, and R. Robiyanto. 2019. Islamic stock market and Sukuk market development, economic growth, and trade openness (The case of Indonesia and Malaysia). *Journal of Business: Theory and Practice* 20: 196–207.

Naifar, N. 2018. Exploring the dynamic links between GCC Sukuk and commodity market volatility. *International Journal of Financial Studies* 6: 72.

Nisak, K. 2022. Sukuk Negara Sebagai Alternatif Pembiayaan APBN di Indonesia. *Etihad: Journal of Islamic Banking and Finance* 2: 57–72.

Nyazee, I.A. 2020. The definition of Riba or the failure of modern scholars to understand the true meaning of Riba. *Available at SSRN 3522646*.

Pribadi, Y. 2020. Pemanfaatan Sukuk untuk Pembiayaan Proyek Infrastruktur pada Kementerian Pekerjaan Umum dan Perumahan Rakyat. *Jurnal Ilmu Administrasi Publik* 8: 275–284.

Purniaji, M., and S. Sunarsih 2022. The effect of state Sukuk and macroeconomics on the trading volume of corporate Sukuk with yield and Sukuk rating as control variables. *Jurnal Manajemen dan Keuangan*, 11, 229–243.

Radzi, R.M., and A. Shaharuddin. 2018. The idealization of risk-profit sharing in partnership-based Sukuk (Islamic bonds): why Sukuk Are experiencing default? *International Review of Management and Business Research* 7: 632–644.

Razak, S.S., B. Saiti, and Y. Dinç. 2019. The contracts, structures and pricing mechanisms of Sukuk: a critical assessment. *Borsa Istanbul Review* 19: S21–S33.

Rodoni, A., and A. Setiawan. 2019. Risk and return: bonds and Sukuk in Indonesia. *Al-Iqtishad: Jurnal Ilmu Ekonomi Syariah (Journal of Islamic Economics)* 8: 255–270.

Salsabilah, K., A. Habbe, and N. Nirwana. 2021. The effect of Sukuk structure and Sukuk guarantee status on Sukuk rating in. *Indonesia Stock Exchange Journal of AFEBI Islamic Finance and Economic Review* 6: 147–161.

Setiawan, R.A. 2022. Issues in Islamic derivatives and proposals for reforms in the OTC Market in Indonesia. *Journal of Risk and Financial Management* 15: 222.

Shafie, M.M., M. Zain, M. Noor, and N.A.R.N.A. Ghani. 2020. Commodity Murabahah deposits in Islamic banking: an easy way out. *Islamiyyat: International Journal of Islamic Studies* 42 (1): 15–22.

Sial, M., J. Cherian, A. Meero, A. Salman, A. Abdul Rahman, S. Samad, and C. Negrut. 2022. Determining financial uncertainty through the dynamics of Sukuk bonds and prices in emerging market indices. *Risks* 10: 61.

Sifat, I., A. Mohamad, H.C. Zhang, and P. Molyneux. 2023. Reevaluating the risk minimization utility of Islamic stocks and bonds (Sukuk) in international financial markets. *The European Journal of Finance* 29: 185–206.

Smaoui, H., K. Mimouni, H. Miniaoui, and A. Temimi. 2020a. Funding liquidity risk and banks' risk-taking: evidence from Islamic and conventional banks. *Pacific-Basin Finance Journal* 64: 101436.

Smaoui, H., K. Mimouni, and A. Temimi. 2020b. The impact of sukuk on the insolvency risk of conventional and Islamic banks. *Applied Economics* 52: 806–824.

Statistic Indonesia. 2023. Indonesian economic report, 2015. Statistics Indonesia.

Suwandaru, A., R. Rooswidjajani, and H. Brimantyo. The effect of agricultural productivity and fossil energy use on CO 2 emissions in the Philippines; an environmental Kuznets curve approach. E3S Web of Conferences, 2022. EDP Sciences.

Tawiah, V., and E. Gyapong. 2023. International financial reporting standards, domestic debt finance and institutional quality: evidence from developing countries. *International Journal of Finance & Economics* 28: 2915–2936.

Uddin, M.H., S.H. Kabir, M.S. Hossain, N.S.A. Wahab, and J. Liu. 2020. Which firms do prefer Islamic debt? An analysis and evidence from global sukuk and bonds issuing firms. *Emerging Markets Review* 44: 100712.

World Bank. 2023. *World development indicators* 2005. Washington, DC: The World Bank.

Yıldırım, S., D.C. Yıldırım, and P. Diboglu. 2020. Does Sukuk market development promote economic growth? *PSU Research Review* 4: 209–218.