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Financing Biofuel Through Green Sukuk Corporate: Stage, Potential, and Maturity

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Abstract

Climate mitigation and adaptation policy financing have emerged as a critical topics in climate discussions. Effective financing schemes are often debated as potential mitigation measures, with the proceeds going toward adaptation activities. This research aims to investigate the viability of green sukuk corporate as a source of financing for biofuel development initiatives in Indonesia. A forecasting process, indexation, and early warning system (EWS) method are used to test the model to assess possible risks at a specific maturity level. In this study, factor variables include GDP, Inflation, the Jakarta Islamic Index (JII), sukuk corporate outstanding, and accumulated sukuk corporate issued. The main findings of this study suggest that to generate sustainable biofuel finance, three-stage models/concepts must be built; the commitment to business as usual, the greenhouse gas mitigation stage, and the debt repayment stage. In terms of potential, the trend of green corporate sukuk is toward greater participation by sovereigns and non financial corporations. In terms of maturity, corporate green sukuk requires a longer repayment period than conventional bonds, with a time tenor of 3–5 years being suitable. Finally, we show that the issuance of green corporate sukuk is supported by macroeconomic stability. The bond scheme can be repaid and carried out to provide sustainable benefits for renewable energy.

Key words : Financing, Green Sukuk Corporate, Biofuel, Climate Mitigation

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INTRODUCTION

The development of industrialization since revolutionary industry in the late 18th and 19th centuries led to massive increases in the world's population, income per capita, and consumption of goods and services. Increases in the consumption of fuels and the production of energy have enabled innovation in all facets of the economy. Technology advancements in agriculture have enabled constant population growth.

Over the past 150 years, the global population has increased by more than six times, amplifying the impact of humans on the environment. In tandem with population growth, rising income has increased output and consumption. The increase in purchasing power has exacerbated the greenhouse effect in virtually all sectors that emit CO_2 (carbon dioxide), such as agriculture, production, energy consumption, and transportation. Unsurprisingly, the increase in greenhouse effect emissions parallels the increase in economic output and population.

Future global temperatures are highly dependent on the rate of drastic reduction of greenhouse gas emissions. It can be observed in the frequency of natural disasters such as sea level rise, climate change, coastal flooding, droughts, and heat waves in some parts of the world. Reducing greenhouse gas emissions will eventually necessitate the development of effective climate mitigation and adaptation policies, including developing alternative energy sources such as biofuels (Kung et al., 2022). Greenhouse gas emissions are inextricably linked to energy generation, industrial production and services, transportation, food production, and other means of improving well-being. Eco-friendly energy transformation requires financing, which must be fulfilled.

Using biofuels as an alternative to fossil fuels has become the right solution for reducing greenhouse gas emissions. The use of biofuels can reduce pressure on dwindling petroleum reserves and open up new opportunities for agriculture and the processing industry. Overall empirical analyses (Correa et al., 2019; Liu et al., 2021; York & Bell, 2019) mention the use of biofuels also has a positive impact on the environment and human health because it produces lower greenhouse gas emissions than fossil fuels which can dama-ge the earth and human health.

The required capital expenditures are substantial for this scheme, but they are realizable. The newest alternative that is possible to become a source of financing is the green sukuk corporation, and it has been proven to be effective in improving environmental performance (Anderson, 2016; Gianfrate & Peri, 2019; Yeow & Ng, 2021)

Sukuk is frequently issued for infrastructure projects when big investments are required. During moments of excessive savings, this makes a lot of sense. The sukuk issuer sells the sukuk to investors with an agreement to pay the primary debt plus a premium on a fixed maturity date. Repayment can be a single lump sum or frequently scheduled payments. Sukuk also prioritizes the principle of justice because the issuance of sukuk has a Sharia Supervisory Board that is more focused on a substance to help benefit Islamic finance (Al Madani et al., 2020)

Green Sukuk is distinguished by its explicit emphasis on environmental and climate yield enhancement. Because "green" is a selling key point, it is necessary to specify green practices and set green goals. Specific financed initiatives and concepts must be evaluated to select and use sukuk with a genuine environmental impact instead of merely capitalizing on the green movement (Niyazbekova et al., 2021). Furthermore, Ceres (2014) developed a set of green sukuk principles that recommend a set of practices for various stages of a green sukuk's lifecycle, including the use of outcomes, project selection, outcome management, and project reporting. Biofuels, renewable energy, and energy efficiency are proposed green projects that are anticipated to significantly impact climate outcomes (Rao & Gupta, 2015).

The three groups of institutions that issue green sukuk are private firms (corporate), the government, and international institutions. Although the objective of each institution is to raise capital for green investments, the characteristics of certain sukuk vary based on the type of issuer. Since the World Bank issued the first

Green Bond in 2007, numerous pub-lic and private institutions have recognized the opportunity to increase their income, which can significantly support climate pol-icy. In addition, many private companies have turned to green sukuk as a source of financing. Increasing environmental awareness has also led companies to enact corporate social responsibility policies and ecological projects through sustainable financing (Piñeiro-Chousa et al., 2021). Several banks and other financial institutions have taken note and begun to offer green sukuk (Anton & Afloarei, 2020). Growing investor green consciousness is a major factor in the market expansion of green bonds. It is crucial to make sure companies choose green bonds more often than traditional instruments when considering the function of green bonds in corporate sustainability practices by directing long-term, large-scale finance toward sustainable economic operations (Barua & Chiesa, 2019; Sinha et al., 2021). This phenomenon will support the hypothesis that in the future green sukuk corporations will continue to be developed and increased, including its use in biofuel financing in Indonesia

Determining the long-term sukuk when they are issued and traded in financial markets in Indonesia is an essential empirical concern. Several influencing criteria for long-term green sukuk issuance have been identified in the public finance database (Azhgaliyeva et al., 2020). GDP growth, inflation rates, investor confidence, and output appear to be the primary macroeconomic drivers of long-term bonds. A greater inflation rate, for example, appears to reduce the issue of long-term climate bonds significantly. The GDP growth also gives incentives to shorten bond maturities. The drop in output and revenue was linked to a decline in issuing long-term bonds. Green sukuk market price movements also provide sentiment for the financial market (Wang et al., 2020). Part 3 examines several factors of sukuk maturity structure using quantitative analysis of currently issued green bonds. The remaining papers are organized as follows, with Part 2 delving deeper into the research technique and methodology. Part 3 outlines a three-stage model of the sukuk ecosystem's timeframe, potential, and maturity structure. Part 4 closes with conclusions and suggestions.

METHOD

This study used a quantitative method using a combination of analyses to test the model. Indexation is used to evaluate the model, early warning systems (EWS) to assess risk and maturity, and forecasting to determine the long-term potential of the green sukuk corporation. Secondary data from the Financial Services Authority (OJK), the Central Statistics Agency (BPS), and Bank Indonesia (BI) were used. Gross Domestic Product (GDP), Inflation (INF), Jakarta Islamic Index (JII), Sukuk Corporate Outstanding, and Accumulated Sukuk Issued are all variables in this study.

Forecasting models use exponential triple smoothing (ETS) approaches to calculate or estimate future values based on existing (historical) values. The anticipated value is the selected target date's ongoing historical value.

Mean Absolute Percentage Error

$$MAPE = \frac{100}{n}\sum_{t=1}^{n}\left|\frac{A_t - F_t}{A_t}\right| \quad (1)$$

To estimate the component level

$$L_t = \propto (L_t - S_{t-1}) + (1 - \propto)(L_{t-1} + T_{t-1}) \quad (2)$$

To estimate the trend part

$$T_t = \beta(L_t - L_{t-1}) + (1-\gamma)S_{t-1} \quad (3)$$

To estimate the seasonality component

$$S_t = \gamma(Y_t - L_t) + (1-\beta)T_{t-1} \quad (4)$$

For the forecast to p of the specific data

$$\hat{Y}_{t+p} = L_t + pT_t + S_{t-l+p} \quad (5)$$

Where *L* is level estimate (influenced by the amount of α); *T* is the trend estimate (influenced by the amount of β); *S* is seasonality estimate (influenced by the amount of γ; *p* is seasonal period; *l* is length data; *Y* is the actual data; $\tilde{Y}$ is Value forecast for the upcoming period.

Individual indexes are used to assess relationships for specific aims that may necessitate the usage of aggregate index. It is a function expressing one variable with another depending on the projected consequences of the same goal (Nardo et al., 2005). Then, as seen below, each variable must be turned into an index:

$$I_{it} = \frac{(X_{it} - \bar{X}_i)}{\sigma_i} \quad (6)$$

Where I_{it} is salue of a single index of variable I at time t; X_{it} is value of a variable I at time t; $\overline{X_i}$ is average value of variable I at time t; σ_i is standard deviation of variable i.

Using Analytical Hierarchy Process (AHP) analysis, this study identified the most important variables and coherence in combination factors. Coherence reflects the degree to which data are logically and consistently connected. In the context of variables, coherence has two characteristics: cross-time coherence and coherence between variables. Both coherences imply that variables are founded on fundamental concepts, definitions, and evolved methods or that deviations can be explained and tolerated. Testing is essential to establish whether each expert assignment of various indicators has a logical consistency test to eliminate inconsistencies (Kedong et al., 2019). The HCR approach employed in this study aims to establish a priority hierarchy of factors that form the HCR index of no more than 0.10 or 10% (Saaty, 2008).

$$HCR = \frac{CI}{RI} \quad (7)$$

$$CI = \frac{\lambda maks - n}{n-1} \quad (8)$$

$$RI = \frac{1.98*(N-(n-1))}{N} \quad (9)$$

Where CR is consistency ratio; CI is consistent index; RI is random index (0,9); and N is the number of criteria or sub-criteria.

The study used indexation analysis techniques developed by (Nardo et al., 2005), which was also published in the OECD, (2015) with various adjustments by the authors. Model testing employing indexation and early warning system (EWS) approaches must be evaluated in multiple ways. The noise-to-Signal-Ratio (Wrong Signals) = measures the false signals. The proportion of probability of crisis without B/(B+D) signals = given the signal is important, a crisis without signals was extremely reduced or minimized. C/(C+D). A good probability forecast for an event is generated by minimizing the anticipated loss function and the sum of "*anticipating errors*" and "*mitigating errors*" with weights associated with each type of error, as indicated in the equation.

$$L(\mu, \tau) = \mu P T_{1(t)} + (1-P) T_{2(t)} \quad (10)$$

Where $L(\mu,\tau)$ is lost function; μ is preference parameter (The values are equal to 0.5); τ is threshold multiplier; P is the ratio of P $(\frac{A+C}{A+B+C+D})$; $T_{1(t)}$ is the number of values in the sample model $(T_{1(t)} = \frac{C}{A+C})$; and $T_{1(t)}$ is the number of values in the sample model $(T_{2(t)} = \frac{B}{B+D})$.

Assess probability estimates by comparing estimated models to observable events. In practice, quadratic probability scores (QPS), universal assessment procedures, are applied (Kaminsky, 1999). The QPS has T probability forecasts:

$$QPS = \frac{1}{T} \sum_{t=1}^{T} 2 \left(P_{T+t} - R_{T+t}\right)^t \quad (11)$$

Note: The QPS ranges from 0 to 2, with a score corresponding to perfect accuracy

Where *T* is Number of periods of observation; *Pt* is probability ($C_{t,\ c+n}$) of a crisis in the period (t, t+*n* months)' *Rt* is the actual time series of observations on ($C_{t,\ c+n}$) where *Rt = 1*

Calibration of the global square bias (GSB) is used to assess forecast calibration by comparing the probability of the average estimate with the observed relative frequency (Imansyah, 2009):

$$GSB = 2\ (\bar{P} - \bar{R})^2 \qquad (12)$$

Note: The GSB is between 0 and 2, with 0 corresponding to perfect global calibration, which occurs when the average probability estimate equals the average realization.

Where:

$$\bar{P} = \frac{1}{T} \sum_{t=1}^{T} P_t;$$

$$\bar{R} = \frac{1}{T} \sum_{t=1}^{T} R_t;$$

T is Number of periods of observation; P_t is Probability (Ct, c+n) in the period (t, t+*n* months); R_t is the actual time series of observations on (Ct, c+n) where $R_t = 1$.

RESULTS AND DISCUSSION

It is no longer debatable that the usage of fossil fuels contributes significantly to gas emissions. In the long-term economic, ecological, and environmental sustainability demand immediate investments must be made in climate change mitigation strategies. The scenario investment required is substantial, but there is the possibility of utilizing financial resources that are currently underutilized. The availability of public cash is currently a financing option (Ng & Tao, 2016; Quang & Thao, 2022).

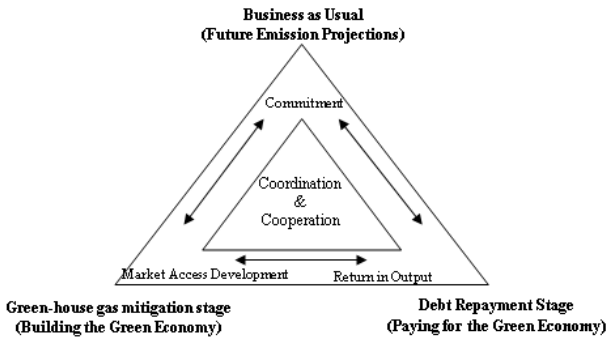

Figure 1. Three Stage/ Model for Green Sukuk Corporate Financing

The green sukuk corporate issued today and reimbursed at a later date is an opportunity to establish a portion of the cost of mitigates. To address the problem, this study further develops research from Flaherty et al. (2017), namely three models/concepts (continuous timelines) that must be constructed in a green sukuk corporate as financing for biofuel development in Indonesia. (i) the commitment of the business-as-usual (BAU) stage, (ii) the stage characterized by the mitigation of the greenhouse effect funded by the issuance of green sukuk corporate, and (iii) the debt repayment stage.

Business-as-Usual is a neutral policy reference for future emissions, a projection of future emissions without Reducing Emissions from Deforestation and Forest Degradation (REDD) activities. Indonesia's commitment in 2009 experienced a voluntary reduction in emissions by 26% below the business as usual (BAU) level in 2020 and 41% with international assistance. In 2015, Indonesia delivered an Intended Nationally Determined Contribution (INDC) with a target of reducing emissions by 2030 by 29% with its efforts and 41% with international assistance. Indonesia's INDC covers the energy, industry, agriculture, land use management and forestry sectors, and waste. To achieve these targets, resource mobilization is critical in supporting climate mitigation and adaptation actions (Suroso et al., 2022). In the NDC roadmap, it is estimated that Indonesia will need financing of

approximately USD 322.9 billion to implement mitigation actions, excluding the cost of adaptation actions and the creation of a supportive environment. This kind of commitment is a form of government, corporate, and society support that must be carried out (Endri et al., 2022; Zhichkin et al., 2020).

Green sukuk corporate supports greenhouse gas reduction in the model's second stage. The fundamental aspects of this stage remain unchanged. However, the cost of deductions is accounted for in the capital equation, the emission function, and the state equation is incorporated to account for public debt growth. Representative families choose consumption to maximize utility over time. Under this paradigm, the construction of legal certainty, investment governance, and transparency of green sukuk must be carried out. Significant obstacles that green sukuk issuers must overcome include poor green taxonomy, difficulty recognizing the green assets of projects, difficulty quantifying benefits, and a high-risk profile. The government must assist the green sukuk market since it is still in its infancy to persuade more organizations to choose green sukuk as their preferred method of project financing (Keshminder et al., 2022).

The third and final phase of the model consists of green bond repayment using increased production due to the accumulation of larger capital shares due to lower greenhouse effect levels and the development of a green economy through ongoing reduction efforts. In the absence of significant greenhouse effect damage, the output is only limited by the taxation necessary to repay public debt and maintain reduction efforts. Green sukuk corporate repayment strategies will differ from traditional sukuk/ bond repayment strate-gies because green sukuk takes longer to pro-vide a return effect.

Green Sukuk was first issued in Indonesia in 2018 with a worldwide market aim and has reached 4.33 billion USD or Rp 62 trillion with investors from all over the world, including 32% of the Islamic market, 25% of the Asian market, 15% of the Europe Union, 18% of the United States, and 10% of Indonesia. Green sukuk retail was also issued three times between 2019 and 2021, raising 11.8 trillion rupiah. According to the Green Framework, this green sukuk will only be distributed to eco-friendly projects. This is a government initiative involving investors that are meant to fund environmentally beneficial projects in general. However, the portion of green sukuk to finance biofuel development has not been a priority until recently. An increase in investors' green awareness plays a significant role in scaling up the green sukuk market (Agliardi & Agliardi, 2019).

According to the forecasting analysis, the issuance of corporate sukuk in Indonesia has a relatively decent future possibility. Figure 3.2 shows a general upward tendency in the number of sukuk issuances, the number of outstanding sukuk from 2010 to 2022, the accumulated sukuk corporate issued, and the value of outstanding sukuk corporate.

The accumulated sukuk issued in 2010 reached Rp 7.81 trillion, with 47 issuers. This value climbed by 62 percent in 2015 to IDR 9.91 trillion with 87 issuers and will expand by 329 percent to IDR 42.51 trillion with 403 issuers by the end of 2022. Sukuk has successfully delivered refunds compared to the rate of return from investors. Data reveal that the sukuk ecosystem is still functioning well by the end of 2022, with IDR 84.97 trillion of sukuk issued (403 issuers) and IDR 42.51 trillion (221 issuers) in outstanding sukuk status.

Forecasting estimates were analyzed to better understand the potential of sukuk from corporate schemes for biofuel finance in Indonesia. This forecasting is done over one, two, three, five, and ten years. The projected res-ults are astounding; the aggregate value of issuances

will reach IDR 76.88 trillion in 2023, IDR 74.70 trillion in 2024, IDR 78.73 trillion in 2025, IDR 89.64 trillion in 2027, and IDR 122 trillion with 1182 issuers in 2032. According to this forecasting, sukuk is a potential source of financing for biofuel deve-lopment programs in Indonesia. In terms of market dynamics in terms of issuance size, Indonesian sukuk continue to experience an up-ward trend following the global trend of greater participation (Mejía-Escobar et al., 2021).

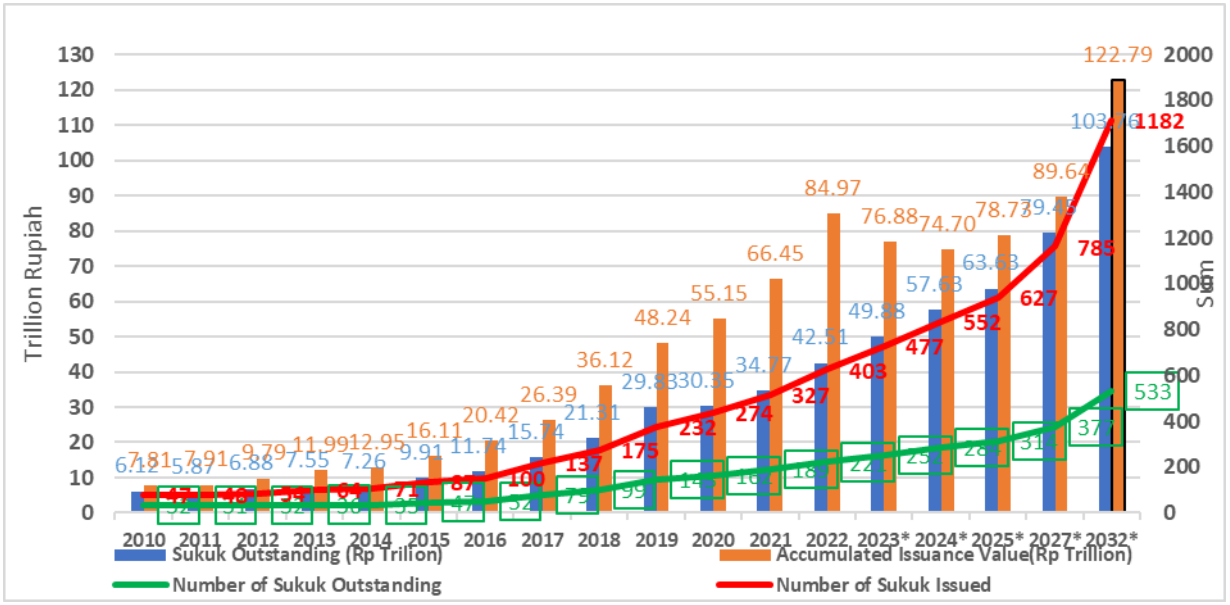

Figure 2. The Potential of Sukuk Corporate in Indonesia 2010-2023 (Forecasting)
*Forecasting 1, 2, 3, 5. And 10 Years

A series of analyses are required to test the model at the appropriate green sukuk corporate maturity degree. The consistency ratio score is required to establish whether or not the variables in a given index are logi-cally connected and consistent with one another. According to the OECD, (2015) coherence can be used to assess basic data quality. The higher the coherence between variables, the better and more validating the index computation outcomes. The Analytical Hierarchy Process (AHP) is used in this study to calculate the Hierarchy Consistency Ratio (HCR), which measures coherence among variables.

The result, as indicated in Table 1, is that the composite index has an HCR of 8%, which is less than 10% (Saaty, 2008). All variables meet the coherence requirements as a measure that can be used to determine the quality of index data. Through AHP analy-sis, macroeconomic sentiment factors through economic growth play the most important role in developing corporate tribes in the country. Furthermore, followed by the inflation rate while the total accumulation of sukuk influe-nces 0.13%. Surprisingly, the movement of market sentiment through the Jakarta Islamic Index plays an insignificant role. This may indi-cate that investors are still generalized to the financial market in conventional (Tu et al., 2020). Hence, green sukuk corporate is also supported by conditions of macroeconomic sta-bility.

The primary variables' quality can be mea-sured in terms of I timeliness, (ii) relevance, (iii) correctness, and (iv) calibration. As a validation component, identifying performance results fr-om the out sample is used to determine the best time horizon and their quality.

Table 1. Consistency Model

	0.50	**0.26**	**0,03**	**0,07**	**0,13**				
Criteria Weight	GDP	INF	JII	Sukuk outstanding	Total accumulated Sukuk	**Weighted sum value**	**Criteria weighted**	**Ratio**	**Ratio %**
GDP	0.50	0.78	0.31	0.51	0.67	2.77	0.50	5.55	
INF	0.17	0.26	0.24	0.37	0.40	1.44	0.26	5.54	
JII	0.06	0.04	0.03	0.02	0.03	0.18	0.03	5.15	
Sukuk Outstanding	0.07	0.09	0.10	0.07	0.04	0.38	0.07	5.19	
Accumulated Sukuk Issued	0.10	0.09	0.17	0.22	0.13	0.71	0.13	5.32	
							Lambda max=	5.35	
							CI	0.09	
							Random index	1.12	
							Consistency ratio	0.0778	8%

Source: Author's Calculation

The variables' timeliness or time horizon reflects the amount of time between the availability of the data and the event or phenomena they describe. The time horizon employed in this model's projections is 1, 2, 3, 5, and 10 years. The time horizon helps their ability to predict systemic risk, which offers adequate time for green sukuk corporate to enhance their level of resilience. Corporate green sukuk funds appear to have a higher rate of return than traditional bonds. According to the predicted model based on the aggregate index, the ideal tenor of green sukuk (maturity) as a source of finance for the biofuel development program is 3 to 5 years. This undoubtedly considers macroeconomic variables and the market's reaction to its issuance. These results are supported by research (Wang & Chu, 2022) green bonds are considered a relatively safe investment tool due to policy support and high credit ratings. Green bonds have environmental benefits, so they must be offset by longer returns.

The variables' relevance is a quantitative assessment of the value given by the data. The value is defined by the extent to which the indicator's overarching goal is met. In this context, relevance is defined as the level of resilience demonstrated by a loss function that aggregates to 0.02-0.50.

The degree to which the variables correctly estimate or describe the quantities or traits they are supposed to measure is called accuracy. In this aspect, the Quadratic Probability Score (QPS) is used to analyze all variables. QPS values vary from 0 to 2, with 0 representing perfect precision. According to the model, the aggregate accuracy is 0.21-1.30, and the aggregate accuracy of all variables is below 2, which means perfect accuracy. This result was achieved with a model calibration threshold of 0.02-1.62. The proportion of observations that accurately anticipate the crisis period and the non-crisis period is the precision in forecasting the probability of the existence of a crisis. Global Square Bias (GSB) is between 0 and 2, with 0 representing perfect calibration.

Green sukuk yields are generally aligned with climate mitigation financing literature. The scenario is unique in the context of the sukuk market analysis. This empirical portion underlines the foundation of mitigation bonds with distinguishing features, in which financing the growth of biofuels with sukuk has significant potential but takes longer to mature for inves-

tors. Green sukuk provides a stable portion of the refund rate in the long run. However, corporation-issued sukuk must be guaranteed by friendly policies including low taxation; (Boutabba & Rannou, 2022). The public sector can mitigate risks associated with long-term investment projects. Green sukuk, on the other hand, exhibit higher yields, but also higher volatility, making them less attractive to risk-averse investors. However, depending on factors such as issuers, currencies, ratings, tax, policy, and sectors, green bonds may have lower yields but also lower volatility, resulting in higher return-risk ratios (Braga et al., 2021). The issuance of green sukuk also shows that investors do not need to sacrifice yield when investing in biofuel assets and projects or other environmentally friendly projects that support climate change mitigation and adaptation efforts.

Table 2. Maturity Analysis

	Model	Threshold	Time Horizon	Loss Function	Accuracy (QPS)	Predictive Power (GSB)	Probability Failure without Signal	Probability No Failure with Signal
Aggregate	μ = 0,5	Upper	3 years	0.0250	1.3000	0.0200	0.0000	0.5000
Index		Lower	5 years	0.5000	0.2100	1.6200	0.0000	1.0000
GDP	μ = 0,5	Upper	2 years	0.5000	0.0909	0.0000	0.0000	0.3150
		Lower	2 years	0.0000	1.2700	0.0165	0.0909	0.0000
INF	μ = 0,5	Upper	3 years	0.4500	1.2000	0.0200	0.0000	0.5000
		Lower	5 years	0.0111	0.9000	0.0200	0.1111	0.1111
JII	μ = 0,5	Upper	2 years	0.0000	0.0000	0.0165	0.0909	0.0000
		Lower	2 years	0.0091	0.0909	0.0165	0.1000	0.1000
Sukuk	μ = 0,5	Upper	2 years	0.0000	0.0909	0.0165	0.0909	0.0000
outstanding		Lower	2 years	0.0000	0.0909	0.0000	0.0909	0.0000
Accumulated	μ = 0,5	Upper	2 years	0.0273	0.0909	0.0165	0.1111	0.2000
Sukuk Issued		Lower	5 years	0.0000	0.1250	0.1250	0.2500	0.0000

*Trend: one-sided HP Filter *Lamdha (λ) 100 *Level of multiplier 1.55

Source: Author's Calculation

CONCLUSION

This study develops three key principles for using green sukuk corporate as an alternative to financing for biofuel development initiatives in Indonesia. First, the Schema must be structured by three sustainable path models: business-as-usual commitments to reduce emissions, the creation of a greenhouse mitigation stage of climate change mitigation measures, including the creation of a green sukuk financing ecosystem with good governance and mutual benefit, and a timely debt repayment stage investor refund strategy. Second, because of its business-to-business nature, green sukuk issued by firms has significant future potential in size and market share. Third, the maturity level of green sukuk is expected to be higher/ longer than traditional sukuk/bonds because the climate benefits of green investment will not be generated quickly. Green sukuk corporate should have a longer-term structure as an instrument, especially if financial rewards are not always commensurate with the investment option. According to the model, green sukuk maturity for the optimal financing development of biofuel in Indonesia is 3 to 5 years.

Based on the researcher's conclusion, the following suggestions are: 1). Governments and enterprises must commit to climate cha-

nge mitigation, developing a sustainable and profitable green sukuk financing environment, and timely refunds; 2). The government or issuers must determine the ideal frequency of green sukuk issuance to maintain public demand for the instrument for 3 to 5 years. Due to the peculiarities of retail marketed to domestic investors, issuers of corporate green sukuk must additionally pay attention to reporting documentation. This transparency can take the form of periodic reports detailing the development of the sponsored project; 3). Socialization of ESG principles, SDGs, and green sukuk corporate instruments should be improved to raise public understanding of these concepts.

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