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RELATIONSHIP BETWEEN ECONOMIC GROWTH, RENEWABLE ENERGY, INTERNATIONAL TRADE AND SUKUK: A CASE STUDY OF 12 SUKUK USER COUNTRIES

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Abstract: The purpose of this study is to examine the simultaneous influence of Renewable Energy, International Trade, and Sukuk on Economic Growth in 12 Sukuk-consuming countries for the 2014-2021 period. This type of research is Quantitative research using the Simultaneous Two-Stage Least Squares method. Based on the results of the study, it was obtained that Renewable Energy does not affect Economic Growth, it was also found that exports affect renewable energy, but not with Sukuk. So these variables cannot simultaneously encourage renewable energy to affect economic growth. For international trade (exports and imports) it affects economic growth. This study also found that Sukuk does not affect economic growth, in this study Sukuk is still influenced by exports. However, the existing influence has not been able to affect economic growth, since exports have a positively insignificant effect on Sukuk.
Keywords: Renewable Energy, International Trade, Export, Import

Abstrak: Tujuan penelitian ini adalah untuk mengkaji pengaruh Simultan atas Energi Terbarukan, Perdagangan Internasinal serta Sukuk terhadap Pertumbuhan Ekonomi di 12 Negara pengguna Sukuk periode 2014-2021. Jenis penelitian adalah penelitian Kuantitatif dengan menggunakan metode Simultan Two-Stage Least Squares. Berdasarkan hasil penelitian, diperoleh bahwa Energi Terbarukan tidak berpengaruh terhadap Pertumuhan Ekonomi, ditemukan juga bahwa ekspor berpengaruh terhadap energi terbarukan, namun tidak dengan sukuk. Sehingga variabel tersebut tidak dapat secara bersamaan mendorong energi terbarukan untuk mempengaruhi pertumbuhan ekonomi. Untuk perdagangan internasional (ekpor dan impor) berpengaruh terhadap pertumbuhan ekonomi. Dalam penelitian ini juga menemukan bahwa sukuk tidak berpengaruh terhadap pertumbuhan ekonomi, dalam penelitian ini sukuk masih dipengaruhi oleh ekspor. Namun, pengaruh yang ada belum dapat mempengaruhi pertumbuhan ekonomi, karena ekspor berpengaruh secara positif tidak signifikan terhadap sukuk.
Kata Kunci: Energi Terbarukan, Perdagangan Internasional, Ekspor, Impor

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INTRODUCTION

Economic Growth is one of the important things in determining the level of welfare of a country, economic growth is when the value of Gross Domestic Product (GDP) increases without seeing any or no change in the economic structure (Goyena, 2019). In influencing economic growth, there are four factors stated by Mudjarad Kuncoro, namely the population, the number of stocks of capital goods, land area, and natural wealth as well as technology (Pangiuk, 2018).

This natural wealth refers to natural resources as well as energy. These two components are important in supporting the production process of a country (Elinur, 2010). Energy is not only an important component in terms of production but also in consumption. So that its use is needed by everyone. Uncontrolled use without the use of other alternative energy that can last a long time certainly has the consequence of depleting the supply of energy sources that affect the country's economy.

In its journey, alternative energy is found which is referred to as renewable energy. According to the International Energy Agency (IEA) Renewable energy is energy sourced from nature that goes through a process, where this process is continuously occurring. So that this energy will not be exhausted, and in the process, there will be no need to wait a long enough time (Artha & Putra, 2020). However, the use of renewable energy is still unable to recognize fossil fuels, considering expensive financing, resource readiness, and technology and their impact on the economy.

In fulfilling the use of this energy, there are several solutions such as the existence of international trade, which allows the fulfillment of resources and technology from outside, this is in line with (Khan et al., 2020) who expressed their thoughts that wider access in the international market will increase competitiveness so that developed countries can export green technology and for developing countries can import this technology to increase production with technology-based environmentally friendly technology. Financing, Islam has Sukuk as an investment instrument that is principled considering the element of sustainability. This is similar to (Handayani & Surachman, 1999) that Sukuk is a viable instrument in financing the establishment of renewable energy projects. From the presentation, this study examined the relationship between economic growth, renewable energy, international trade, and Sukuk. For the first study investigated the relationship between international trade and economic growth.

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Pp 198-207

His research according to (Amri, 2017) obtained positive and significant influences. This result was obtained for its analysis of developed and also developing countries. Similar to the previous analysis, (Ivandrew, 2020), also found that exports and imports have a significant influence on economic growth. This means that the higher the level of exports and imports from a country will increase the economic growth rate of the country. The findings (Antunes, 2012) also reveal that international trade, especially in Portugal has a positive effect on economic growth. The role of this trade can be seen from the fulfillment of technology through imports which encourages increasing production and the existence of outgoing trade (exports) by developed countries.

The second study focused on the relationship between Sukuk and economic growth. According to (Muharam et al., 2019) there are significant and positive results from the increase in the Sukuk market with economic growth in Indonesia. Where this means that the development of Sukuk in Indonesia has caused an increase in Indonesia's economic growth. Observations made (by Yıldırım et al., 2020) also found a co-integration relationship between the Sukuk market and economic growth. This influence is positive, so it can be translated that when there is an addition of one Sukuk unit, economic growth will increase by the result obtained, which is 0.5%.

The third study focuses on renewable energy with economic growth. The existing findings suggest two possibilities. The first findings show a positive and significant influence between the two as shown by (Sebri & Ben-Salha, 2014) were in his research stated that renewable energy consumption affects economic growth. In the long run, the consumption of renewable energy has a positive and significant influence on GDP, especially for Brazil, besides that economic growth leads to an increase in renewable energy consumption. Just like the study (Hu et al., 2018), states that in the 25 developing countries studied, it was found that the consumption of renewable energy had a significant effect on economic growth.

Furthermore, the second finding suggests that there is no influence between renewable energy and economic growth as indicated by (Chen et al., 2019) it was found that there is only a unidirectional causality relationship between economic growth to renewable energy consumption. This means that economic growth can affect the consumption of renewable energy. But it is not the opposite, namely that the consumption of renewable energy does not influence economic growth. It is not much different from (Menegaki, 2011), in his research it

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Pp 198-207

was found that there was no causal relationship between renewable energy consumption and economic growth, judging from GDP in the European Union. Similar to these two, (Ben Jebli et al., 2015) also state that in sub-Saharan African countries there is no causality relationship between renewable energy consumption and economic growth.

So far, the author has not found an article that discusses the relationship between economic growth, renewable energy, international trade, and Sukuk together. This research also emphasizes that to find the relationship between the four variables, data on countries that use renewable energy and constant Sukuk are needed. So that this study selected 12 countries with the use of renewable energy and Sukuk with a Simultaneous Model during the 2014-2021 period.

METHOD

This research covers countries with the simultaneous use of renewable energy and Sukuk. This is because the number of users of Sukuk is not large, only a few countries, and the use of renewable energy has not been massive. So the 12 countries were elected. Data collection is carried out using the documentation method, namely data fulfillment by looking at reliable sources (Siyoto & Sodik, 2015). The data used is secondary data that includes data on renewable energy, exports, imports, Sukuk, and economic growth. Secondary data are obtained through reliable sources that have been released by authorized institutions.

The study also used multiple regression tools. This analysis tests the presence or absence of the influence of free variables on bound variables. The bound variables are Economic Growth, while the free variables include Renewable Energy, International Trade, and Sukuk. Here is the regression model of the equation:

$$EG = \alpha + \beta_1 RE + \beta_2 IT + \beta_3 S + \varepsilon_i$$

Information:

EG: Economic Growth

α: Constants

β: Independent variable regression coefficient

RE: Renewable Energy

IT: International Trade

S: Sukuk

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Pp 198-207

Because this study uses panel data, there is a need for panel data regression. It is used to find the appropriate approach to the existing data.

After that, proceed with testing with simultaneous equations. Simultaneous equations are equations one has an interdependence with other equations, so the equation must consider other equations (Gujarati & Porter, 2009). This simulation equation uses the 2SLS (Two-Stage Least Squares) method. Here's the equation:

$$EG = \alpha + \beta_1 RE + \beta_2 IT + \beta_3 S + et \quad (1)$$

$$RE = \alpha + \beta_1 IT + \beta_2 S + et \quad (2)$$

$$S = \alpha + \beta_1 IT + et \quad (3)$$

Information:

EG: Economic Growth

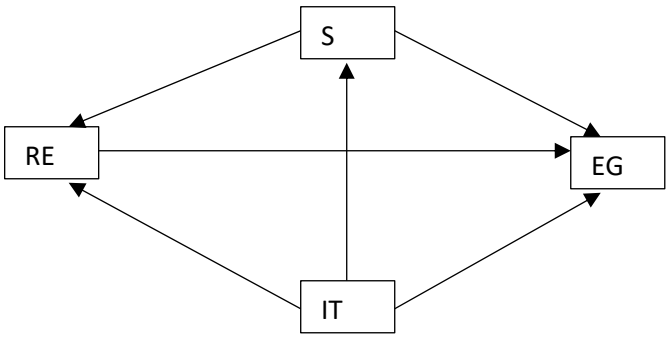
RE: Renewable Energy

IT: International Trade

S: Sukuk

et: *error*

The relationship between the three equations can be shown in the figure below



RESULTS AND DISCUSSION

To give an idea of the object under study from the data used, and to give conclusions of a general nature, a descriptive statistical analysis is carried out which is shown in the following table:

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Pp 198-207

Table 1. Descriptive Statistical Analysis Results

	EG	RE	IT_E	IT_I	S
Mean	1536.904	46458.81	627.4629	646.7784	12418.69
Median	791.0450	9632.000	246.3800	229.7550	1744.000
Maximum	5120.000	325391.0	2540.000	3390.000	102053.0
Minimum	137.2800	24.00000	19.82000	36.08000	55.00000
Std. Dev.	1588.562	71296.69	717.8085	826.0036	21178.79
Observations	96	96	96	96	96

Source: Data Processed 2022

This study in determining the influence of free variables on bound variables using the 2SLS equation. In the estimation, a Random Effect Model approach was obtained by the research data studied and the following is a simultaneous reconciliation model with 2SLS as follows:

EG= -0.010653+ 0.076418RE+ 0.083663IT_E+ 0.454548IT_I+ 0.045022S

RE= 0.113474+ 0.132456IT_E+ 0.033039S- 2.93E-07RE_1

S= 0.094289+ 0.045997IT_E+ 0.223811S_1

Table 2 Results of Estimation of Random Effect Model Approach

Variable	EG	RE	S
C	-0.010653	0.113474	0.094289
D(LOG(RE))	0.076418		
D(LOG(IT_E))	0.083663*	0.132456*	0.045997
D(LOG(IT_I))	0.454548*		
D(LOG(S))	0.045022	0.033039	
D(LOG(RE_1))		- 2.93E-07	
D(LOG(S-1))			0.223811*

Nb: Significant at 5%

In Table 3, there are influences between variables which can be described as follows. First, there is no burden from renewable energy to economic growth. It means that the ups and downs of the use or consumption of renewable energy do not influence the ups and downs of economic growth. Second, there is an influence on international trade (exports and imports). So it can be interpreted that the higher the value of exports and imports, the higher the value of economic growth. Third, there is no anchorage from Sukuk to economic growth. It means that the ups and downs of the use of Sukuk do not influence the ups and downs of economic growth. Fourth, there is an influence of international trade (exports) on renewable energy. So it can be interpreted that the higher the value of exports, the higher the value of renewable energy. Fifth, there is no restriction from Sukuk on renewable energy. It means that the ups and downs of the

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Pp 198-207

use of Sukuk do not influence the ups and downs of renewable energy. Sixth, there is no burden from international trade (exports) to Sukuk. It means that the ups and downs of the use of international trade (exports) do not influence the rise and fall of Sukuk.

Table 3. T Test

Endogen	Exogen	Coefficient	Std.Error	T-statistic	Prob.
EG	RE	0.076418	0.043674	1.749721	0.0840
EG	IT_E	0.083663	0.028038	2.983894	0.0038
EG	IT_I	0.454548	0.063110	7.202432	0.0000
EG	S	0.045022	0.040047	1.124229	0.2643
RE	IT_E	0.132456	0.061899	2.139868	0.0354
RE	S	0.033039	0.098696	0.334753	0.7387
S	IT_E	0.045997	0.068770	0.668856	0.5055

Source : Data Processed 2022

The results of this research found that renewable energy has a positive insignificant effect on economic growth. This positive influence that occurs between renewable energy on economic growth was also discovered by (Sadorsky, 2009), who in his research, used the impulse response function. It was found that renewable energy in this case hydropower and nuclear power has a positive impact on economic growth. From other studies, it was also found that the influence of renewable energy is not related to economic growth, as is the case with research conducted by Menegaki and friends.

At the same time, simultaneously renewable energy is affected by international trade (exports) and Sukuk. However, both have not been able to exert a significant influence on renewable energy to influence economic growth. From the table above it can be identified that those that have a significant influence are only export variables. This is in line with (Chen et al., 2019), that foreign trade is the reason for the consumption of renewable energy itself. Although the research conducted by (Nehal, 2021) is inversely proportional to the current results obtained, this is still considered quite appropriate because the issuance of Sukuk is still small and is still considered new as a financing instrument.

Based on the test results above, it was found that international trade (exports and imports) has a significant positive influence on economic growth. This is by (Azeez, 2014) where the study of Nigeria's economic growth in year 21 shows that international trade as a whole has a significant positive effect. It was also explained that this international trade is a catalyst to increase Nigeria's economic prosperity. Not only Nigeria but in empirical studies by other

countries also obtained similar results, such as the study conducted by (Hussain et al., 2012) found that exports and imports have a significant positive effect on the Pakistani economy.

The result found related to Sukuk is that Sukuk has an insignificant positive effect on economic growth. The same findings were also obtained by (Echchabi et al., 2018), where the study took case studies in the Gulf Cooperation Council (GCC) countries consisting of Oman, the United Arab Emirates, Bahrain, Saudi Arabia, Kuwait, and Qatar. Where the issuance of Sukuk does not have a significant impact on economic growth. At the same time, Sukuk is simultaneously affected by international trade (exports). However, the relationship has not been able to significantly influence Sukuk to influence economic growth.

CONCLUSION

Based on the results of the research, it was concluded that renewable energy has an insignificant positive effect on economic growth. Although at the same time, simultaneously renewable energy is affected by international trade (exports) and Sukuk. However, both have not been able to exert a significant influence on renewable energy to influence economic growth. For international trade (exports and imports) it has a significant positive influence on economic growth. The result found related to Sukuk is that Sukuk has an insignificant positive effect on economic growth. As well as the simultaneous dredging of Sukuk affected by international trade (exports). It has not been able to significantly influence Sukuk to influence economic growth.

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