Green Energy, Globalization, FDI and Government Debt in Indonesia

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Abstract

The link between renewable energy usage, public debt, globalization, FDI, and institutional quality in Indonesia from 1990 to 2021 is examined in this study. All study variables show stationary after the first difference. Cointegration tests have been used to demonstrate the long-term link between the variables provided and the variables specified. This study found that institutional quality and trends in government debt were shown to be negatively correlated. Where the debt of the Indonesian government is significantly inversely the quality of institutions in Indonesia. Globalization, financial development, and FDI reinforce each other in Indonesia and strengthen the quality of institutions in Indonesia. In contrast, Indonesian government debt was disclosed to suppress the institutional quality of the Indonesian government which in turn suppressed the Indonesian economy including FDI. Renewable energy consumption positively affects institutional quality

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Introduction

Institutional quality is very important in the economy where institutions are important pillars in ensuring economic sustainability (Ahmed, Kousar, Pervaiz, & Shabbir, 2022). Institutions guarantee the health of institutions with a set of rules that prevent abuse of power and prevent corruption. Institutional quality has an impact on production and the real sector of the economy (da Silva et al., 2019).

Institutional quality has bound macroeconomic factors to have a positive influence on economic growth (Yakubu, 2020). Trade openness has become a pillar of international economic cooperation which has an impact on international trade flows. The economy and the environment must run well and with quality (Gnangnon, 2019).

The green economy is a pillar of a sustainable economy. The effectiveness of government institutions has a direct impact on the country's economy (Zhang, Ozturk, & Ullah, 2022). Institutions also guarantee economic sustainability and protect the environment. Renewable energy, government debt and FDI are of interest in building a sustainable economy that is free of corruption (Mahbub, Ahammad, Tarba, & Mallick, 2022).

Renewable energy is directly related to the green economy. Institutional quality plays a dominant role in the success of a green economy. Renewable energy gives a touch to the quality of state institutions (Yang, Du, Razzaq, & Shang, 2022). Institutional quality such as corruption

prevention has a positive impact on the economy and green economy consumption. Increased consumption of green energy has an impact on improving institutional quality (Uzar, 2020).
Government debt is an indicator of institutional quality and the effectiveness of state financial arrangements. However, an increase in state debt has an impact on a decrease in institutional quality (Mohsin, Ullah, Iqbal, Iqbal, & Taghizadeh-Hesary, 2021). Other studies show that an increase in government debt actually increases institutional quality. Government debt can encourage investment and promote economic growth (Ben Ali, & Ben Abdul Aziz Al Yahya, 2019). However, government debt has a complex effect on the quality of state institutions and is very vital in the economy (Maris, Sklias, & Maravegias, 2022). Government debt also has a negative influence on the nation's future (Qamruzzaman, Karim, & Jahan, 2022).
Globalization drives economic growth in many countries and improves the quality of state institutions (Nasreen, Mahalik, Shahbaz, & Abbas, 2020). International competition encourages the improvement of institutional quality and economic efficiency (Hayat, 2019). Globalization has clearly provided an impetus for increasing the quality of institutions in many countries (Farooq, Ozturk, Majeed, & Akram, 2022). However, the impact that globalization has had on institutional quality varies in many places (Godil, Sharif, Ali, Ozturk, & Usman, 2021).
The gap between previous studies with conflicting results is our empirical gap in conducting research. The issue raised in this study is the dependence of the economy on consumption of fossil energy where economic growth must be paid for by a decrease in environmental quality, besides that this research also raises institutional quality, globalization and government debt which are still very complex and still need to be explored. The goal of this research is to thoroughly examine the interactions between government debt, institutional quality, globalization, and renewable energy.

Literature Review

Institutional qualities indicated by the level of corruption are in line with the level of government debt (Briceño & Perote, 2020). The higher the level of corruption which is used as a benchmark, the lower the quality of state institutions, followed by an increase in government debt which is also higher (Del Monte & Pennacchio, 2020). Corruption, democracy and the shadow economy have a significant impact on the economy. Poor institutional quality increases corruption constrains economic growth and increases government debt (Nguyen & Luong, 2020).
Good state governance with high institutional quality promotes economic growth. However, government debt in developed countries with good economies still tends to be high. This is of course a mystery that still needs to be investigated further (Adedoyin, Erum, & Bekun, 2022).
Long-term increase in corruption hinders economic growth. The increase in corruption was also followed by an increase in government debt (Ibrahim, 2020). But countries with very low levels of corruption also still have government debt (Law, Ng, Kutan, & Law, 2021). Although in many studies, the level of corruption is negatively correlated with government debt (Shittu, Ismail, Abdul Latiff, & Musibau, 2020), there are several studies that find that the level of corruption in countries with low levels of corruption has no effect on state debt (Fagbemi & Olatunde, 2019).
The two main causes of economic failure are corruption and the shadow economy. According to Dada, Ajide, and Adeiza (2022), corruption is a sign of the caliber of institutions that have an immediate influence on the economy. There is no doubt that corruption contributed to the rise in governmental debt. However, corruption cannot have a direct impact on the rise in the national debt.Corruption has a direct impact on increasing government debt and decreasing the quality of government spending so that it has a direct impact on economic decline through a decrease in the quality of infrastructure and a decrease in the quality of public services (Abid & Sekrafi, 2020).

Increasing the quality of institutions improves the economic climate and increases investment which in turn improves the economy (Huynh, Nguyen, Nguyen, & Nguyen, 2020). Institutional improvements have an impact on increasing FDI which encourages growth in the real sector which has an impact on increasing economic growth (Zakari, A., & Khan, I. (2022). Economic improvement and globalization increase technology imports thereby encouraging good economic efficiency (Usman, Jahanger, Makhdum, Balsalobre-Lorente, & Bashir, 2022). However, the effect of globalization on improving institutional quality is not the same in many places (Islam, Khan, Tareque, Jehan, & Dagar, 2021).

Globalization is positively tied to the rules of international law where institutional qualities determine the success of globalization in improving the economy (Hammudeh, Sohag, Husain, Husain, & Said, 2020). The impact of globalization is also not always positive. Globalization does not always help developing nations' economies grow; in fact, for certain nations, it tends to make things more difficult. The effectiveness of a nation's institutions determines how globalization affects its economy (Le & Ozturk, 2020).

Globalization in several countries actually suppresses the quality of institutions because the independence of the state is eroded due to globalization. Globalization fills up failed state legitimacy and increases conflict and chaos due to the failure of institutions to take advantage of globalization (Paul, 2021). Globalization also increases competition which sometimes for countries that are not ready to become a frightening thing because their independence is eroded. Globalization can suppress corruption in countries with economies middle and high country but is still a mystery to developing countries. Several studies have found surprising results that globalization has no effect on the quality of institutions in developing countries (García, 2019).

Research methods

The link between renewable energy usage, public debt, globalization, FDI, and institutional quality in Indonesia from 1990 to 2021 is examined in this study. In order to analyze institutional quality and globalization, this study looks at FDI and renewable energy inflows. The final empirical relationship between the described variables and the explanatory variables is as follows

$IQ_t = \alpha_0 + \beta_{1t}\, GDt + \gamma_{1t}\, GLO_t + \gamma_{1t}\, FDI_t + \delta_{1t}\, RE_t + \epsilon_t$

Where the coefficients of β_{1t},β_{1t},γ_{1t} and δ_{1t} explain the magnitudes of renewable energy (RE), government debt (GD), globalization (GLO), FDI, and financial development on institutional quality (IQ). The intercept and white noise report in α_0 and α

Institutional quality in this study is measured by taking into account a proxy taken from six indicators from the WGI database through Principal Component Analysis (PCA). Globalization can create new jobs and reduce costs for parent companies. Globalization promotes economic growth and living standards of developing countries. This study applies tests to the unit roots of Dickey and Fuller, Phillips and Perron. This study conducted the Ng-Perron Ng and Perron unit root test. For long-term assessment, this study applies the Bayer and Hanck joint cointegration test, the Fishers equation. The Maki cointegration test has been used with unknown structural breaks.

Results and Discussion

One argument made in support of the need for a unit root test is the sequence in which the variables were integrated. Table 1 displays the findings for the unit root.

Table 1. The Unit Root Test

At level				
Variables	ADF	GF-DLS	PP	KPSS
IQ	-1.3118	-1.2007	-0.9227	-0.8227
DEBT	-1.0911	-1.1123	-0.7232	-0.7233
GLO	-1.0015	-1.1221	-0.8724	-0.2341
FDI	-2.1158	-1.8247	-1.2237	-0.2242
RE	-1.0311	-1.1223	-1.0253	-0.7722
After first difference				
IQ	-8.2331	-7.2231	-5.1336	-0.2121
DEBT	-7.1311	-6.2133	-6.1311	-0.2112
GLO	-6.8025	-5.7132	-5.7613	-0.1221
FDI	-5.2731	-4.7116	-4.1341	-0.1212
RE	-7.1232	-6.2331	-5.1341	-0.2712

All variables are stationary at the first difference, according to the test findings in Table 1, hence this study employs the first difference in the subsequent estimate. In addition, the results of the Ng-Perron unit root test have shown a similar line of static properties. Following the unit root test, the study used a static test with an unknown structural failure, and the findings are displayed in Table 2.

Table 2. Result Of Unit Root Test With An Unknown Structural Break

Name	At level		After first df.	
	T-stat.	Time break	T-stat.	Time break
IQ	2.2332	2001	5.3116	2008
DEBT	2.7133	2003	6.2321	2005
GLO	2.6234	2004	6.2432	2006
FDI	3.2241	1997	7.1126	2012

RE	2.4232	2002	6.1331	2015

According to the statistical test, all stationary variables in the first difference with one structural break. The long-term association between the variables specified and explained by the combined cointegration of Bayer, Hanck, and Maki is documented in this study using a cointegration test. The null hypothesis of no cointegration was disproved in this study since all test findings were statistically significant at the 5% level, which suggested a long-term connection. Table 3 displays the results of the cointegration test.

Table 3. Reports The Results Of The Cointegration Test

H	Eigenvalue	T- Stat.	0.05 Critical Value	Prob.**
None *	0.521179	11.77231	8.22111	0.0711
At most 1	0.115521	6.013221	7.11252	0.0721
At most 2	0.011221	0.226322	6.13236	0.0621

Furthermore, research extends the assessment of long-term associations. The results of symmetric and asymmetric long-term associations are shown in Table 4.

Variables	Symmetric assessment			Asymmetric assessment		
	Coeff.	T-stat	S.E	Coeff.	T-stat	S.E
DEBT	0.2211	0.003	16.3322	0.0722	0.001	4.0212
GLO	0.7121	0.014	16.1121	0.0712	0.004	5.2232
FDI	0.3322	0.019	17.2234	0.0331	0.007	4.1554
RE	0.3213	0.002	16.2242	0.0311	0.001	6.1232

Long-term cointegration between IQ, DEBT, GLO, FD and FDI under symmetry and asymmetry. Following the discovery of long-term relationships, we examine the elasticity of the explanatory factors on IQ. According to an asymmetric evaluation, a study demonstrates a nonlinear link between institutional growth and renewable energy over long and short durations. According to the findings in table 4, adding renewable energy to the energy mix has a favorable and statistically significant long-term impact on raising institutional quality. The Indonesian government is a key player in promoting renewable energy in Indonesia. FDI in Indonesia is significantly impacted by Indonesia's institutional quality as well. The thing that is of sufficient concern to the Indonesian government is that government debt tends to reduce institutional quality.

Conclusion

Institutional quality and trends in government debt were shown to be negatively correlated. Where the debt of the Indonesian government is significantly inversely the quality of institutions in Indonesia. Globalization, financial development, and FDI reinforce each other in Indonesia and strengthen the quality of institutions in Indonesia. In contrast, Indonesian government debt was disclosed to suppress the institutional quality of the Indonesian government which in turn suppressed the Indonesian economy including FDI. Renewable energy consumption positively affects institutional quality

Limitation

This research is limited by data availability

Suggestion

To enhance institutional quality, policymakers, particularly the Indonesian government, must promote the use of renewable energy. The Indonesian government must be careful in making debt policies because it can reduce the quality of Indonesian institutions. Future research can continue this research by examining more deeply renewable energy with the community's economy.

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