

REALIZING SUSTAINABLE DEVELOPMENT IN INDONESIA THROUGH ECONOMIC GROWTH PRIORITIES: EMPIRICAL EVIDENCE VECTOR ERROR CORRECTION MODEL (VECM)



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Abstract

Indonesia's journey towards sustainable economic development is closely intertwined with global issues in female labor force participation, environmental policy, and geopolitical dynamics. This study analyzes the causal relationship between economic growth, geopolitical risk, the female labor force, and environmental policy rigor in Indonesia. The data type used is a time series starting in 1992–2022, and it uses the Vector Error Correction Model (VECM) econometric model to identify the causal relationship and reveal the long-run and short-run effects between variables. The results of the analysis show that there is a one-way relationship between geopolitical risk and the female labor force. While the long-run test results show that the female labor force, geopolitical risk, and environmental policy have a significant impact on economic growth, The findings also reveal that there is a short-term effect between environmental policy stringency and economic development. This study emphasizes the importance of holistic and integrative policy formulation by considering the interaction of economic growth, women's participation in the workforce, environmental policy, and geopolitical risk to achieve sustainable development. By examining the causality and interdependence of the complex dynamics occurring in the socio-economic landscape, policymakers are expected to promote inclusive growth, consider environmental aspects, and be sensitive to geopolitical challenges in Indonesia's development trajectory.

Perjalanan Indonesia menuju pembangunan ekonomi yang berkelanjutan sangat terkait dengan isu-isu global dalam partisipasi angkatan kerja perempuan, kebijakan lingkungan, dan dinamika geopolitik. Studi ini menganalisis hubungan kausal antara pertumbuhan ekonomi, risiko geopolitik, tenaga kerja perempuan, dan ketatnya kebijakan lingkungan di Indonesia. Tipe data yang digunakan adalah deret waktu mulai dari 1992 hingga 2022, dan menggunakan model ekonometrika Vector Error Correction Model (VECM) untuk mengidentifikasi hubungan kausal serta mengungkapkan efek jangka panjang dan jangka pendek antara variabel. Hasil analisis menunjukkan bahwa terdapat hubungan satu arah antara risiko geopolitik dan tenaga kerja perempuan. Sementara hasil uji jangka panjang menunjukkan bahwa tenaga kerja perempuan, risiko geopolitik, dan kebijakan lingkungan memiliki dampak signifikan terhadap pertumbuhan ekonomi, temuan tersebut juga mengungkapkan bahwa ada efek jangka pendek antara ketatnya kebijakan lingkungan dan perkembangan ekonomi. Studi ini menekankan pentingnya perumusan kebijakan yang holistik dan integratif dengan mempertimbangkan interaksi antara pertumbuhan ekonomi, partisipasi perempuan dalam angkatan kerja, kebijakan lingkungan, dan risiko geopolitik untuk mencapai pembangunan berkelanjutan. Dengan memeriksa kausalitas dan saling ketergantungan dari dinamika kompleks yang terjadi dalam lanskap sosial-ekonomi, para pembuat kebijakan diharapkan dapat mendorong pertumbuhan yang inklusif, mempertimbangkan aspek lingkungan, dan peka terhadap tantangan geopolitik dalam trajektori pembangunan Indonesia.

INTRODUCTION

The concept of sustainable development continues to be transformed by intellectual and technological advances, but each of these processes contains highly political elements (Hirai 2022). Various innovations and policies do not necessarily change the discourse, which has been dominated from a growth perspective, as we see on the ground. The importance of economic growth as the main pillar of achieving sustainable development has become the main focus of development policy in Indonesia. In this context, the priority



of economic growth is crucial because it not only determines aspects of economic progress but also embraces social, political and environmental dimensions. This is stated in the national long-term plan (RPJN) 2025–2045 in supporting the implementation of the Golden Indonesia Vision 2045. The concept is designed with four main visions such as per capita income on par with developed countries, 0% poverty and inequality, great leadership and influence in the global world, and high human resource competitiveness (Bappenas 2023). However, despite the concept of sustainable development that demands economic, social, and environmental development, there are various dynamics that need to be considered to ensure that the design can run properly.

Some countries have embraced sustainable development, which leads to the fulfillment of women's rights and should be combined with policy relevance, and in turn contribute to economic growth. This is in line with the concept of sustainable development pursued by the United Nations that, decent work means providing opportunities for everyone to get productive work and provide a fair income, security at work and social protection for families, better prospects including the fulfillment of rights for women. (UN DESA 2023). Women are not only affected by economic problems, but also have many ideas and leadership to solve them. Achieving gender equality and empowering women is an important part of ensuring their rights are met across all goals, including equity and inclusiveness, an economy that works for all and preserving future generations (UN Women 2021).

The importance of the female labor force has long been highlighted by academics. This was revealed in an investigation (Boserup 1970) and (Singer 1976). Therefore, economic empowerment by involving women's labor force participation is an important aspect to strengthen labor force participation and towards gender equality. Apart from human rights reasons, it also contributes to social and economic stability (Hahn 2012). It should be noted that cultural factors, including religious values and ethnic attitudes, are always taken into consideration and influence women's involvement in work. As women spend more time on household chores, they do not have much time to participate in the formal labor force (Appiah 2018). If observed in the report of the Indonesian Central Bureau of Statistics, the female labor force participation rate still shows a very large difference below men, where the male labor force reaches 83.6% and women only reach 54.4%. Even though, half of the population in Indonesia today are women. Of course, this phenomenon implies that patriarchal culture is still deeply rooted in identifying women with domestic work (Miranti 2022). Thus, this fact raises the question of how far Indonesia is prepared to realize sustainable development by advancing women's rights in the name of equality.

To serve the concept of sustainable development, academic rigor including changes and tactics to deal with geopolitical risks is increasingly important today. At the macro level, geopolitical risks often lead to social unrest and inequality (Bokhari, Aftab, and Shahid 2021). Most countries or governments in conflict prioritize short-term goals over long-term ones, hindering policy frameworks and governance structures and undermining sustainable development (Nguyen et al. 2023). Geopolitical incidents are increasingly shaping economic interactions at both local and global levels. Many geopolitical events such as terrorist incidents, national instability, disputes, and geopolitical events pose global risk impacts. These phenomena not only affect people's lives, but also affect the world economy (Dogan, Majeed, and Luni 2021). Geopolitical events with global impact affect investment firms, and economic activity due to the many future threats. Therefore, Geopolitical risk is an important component of sustainable economic development (Li et al. 2023). Empirical evidence on geopolitical risk is revealed in studies (Soybilgen, Kaya, and Dedeoglu 2019) that an increase in geopolitical risks

could lead to a decline in economic growth (Balsalobre – Lorente et al. 2024) In the long run, geopolitical risks cause economic complexity. Therefore, appropriate governance policies are needed to mitigate the risk of global political uncertainty.

Geopolitical risk is significantly impacted during an economic recession. In this situation, understanding the relative importance of these risks is crucial to guiding regulatory strategies in managing the economy in order to control systemic risk and ensure the country's resilience from global politics. Meanwhile, an economic observer (Natalegawa 2021) reveals that a country's leadership is important in influencing the approach and direction of its foreign policy. Indonesia's economic history shows the influence of external factors—both geopolitical and more purely economic in nature (Wangke 2021). Therefore, as an open economy that is part of the global supply chain of value chains, Indonesia cannot avoid the vulnerability of world political risks. Indonesia's position in the geopolitical context comes from trade activities and financial activities in both the stock and securities markets. Departing from the above, a comprehensive policy is needed to be the right solution to geopolitical dynamics that have the potential to affect the Indonesian economy.

In recent decades, environmental protection has been in the spotlight of sustainable development. Therefore, the role played by environmental policy issues in development has always been crucial and as a refinement of academic studies. United States Environmental Protection Agency (2023), Environmental policies must be combined with policy relevance to maximize sustainable development. Although economic growth is accepted as the country's main motivation to promote prosperity, a high degree of harmonization between economic and environmental factors should still be prioritized to achieve sustainable development (Abbasi et al. 2024). Although environmental policies are recognized to mitigate the environmental consequences of economic activities, some empirical studies reveal a number of different views of the results of their investigations such as (Arjomandi et al. 2023) that environmental policies can hinder economic growth. However, studies (Angelis et al., 2019) revealed different results that environmental policies reduce environmental risks and remain effective in realizing economic development. Therefore, the dynamics of environmental policy always present a debate in the academic space. The researcher realizes that the policy framework must be tested in each country, especially in Indonesia, so that the results of empirical studies conducted previously do not cause multiple interpretations and generalize the objectives as expressed by the theorists.

This study addresses a gap in the literature by investigating three primary issues in achieving sustainable development with a focus on economic growth. *First*, although the rate of female participation in the workforce often receives attention for its potential contribution to economic growth, there is limited empirical research analyzing the extent of its influence on Indonesia's economic growth specifically. *Second*, this study explores the challenge of reconciling economic growth with environmental protection. The literature often reflects a debate among theorists regarding environmental policies, frequently viewed as obstacles to economic growth. This situation calls for an empirical approach to find solutions that allow Indonesia to strike a balance between the two priorities without sacrificing either objective.

Third, this study expands on the concept of geopolitical risks as developed by Caldara and Iacoviello (2022), focusing on the dynamics between geopolitics and sustainable economic development in developing countries, particularly Indonesia. By incorporating a prophetic or Islamic approach, which emphasizes shared welfare—or *masalah*—this study examines how Indonesia's commitment to environmental policies, aligned with

sustainable development goals, withstands external political pressures. This study also considers the concept of economic development through an Islamic lens, focusing not only on the creation of facilities, infrastructure, and other conventional measures but also on the subjective well-being of people as the core of development. In Islamic development, the orientation is *people-oriented*, meaning that the success of development should prioritize the common good (*maslahah*) (Jajang, Nur Rianto 2021). Therefore, this study is titled "*Realizing Sustainable Development in Indonesia Through Economic Growth Priorities: Empirical Evidence from a Vector Error Correction Model (VECM).*"

METHOD

Our research is based on secondary data to achieve a goal. The dependent variable used is economic growth, and the independent variables used are geopolitical risk, female labor force, and environmental policy stringency in Indonesia. The type of data used is a time series starting in 1992–2022, and uses a VAR or Vector Error Correction Model (VECM) econometric model to identify causal relationships and reveal long-term and short-term influences between variables. With the data collected from including the following:

Table 1. Operational Definition of Variables

Variable	Type of Variabel	Proxied by	Source
Economic Growth	Dependent	Current US\$	Our World In Data
Geopolitical Risk	Independent	Index (%)	GRI Index
Female Labor Force	Independent	Labor Force	World Bank
Environmental Policy Stringency	Independent	Index (%)	OECD

This study uses a VAR or VECM research model, where the VAR or VECM model is a model that includes both independent and dependent variables in a regression analysis. The use of the VAR or VECM method is because it is often very difficult to find the dependence between the dependent variable and the independent variable in a constant state, or in other words, the effect of the independent variable on the dependent variable (Putri 2020)(Sudarmawan 2022). Can be written as follows:

$$EG_t = \beta_0 + \beta_1 GR_t + \beta_2 FLF_t + \beta_3 EPS_t + e_t$$

$$\Delta EG = \theta_0 + \sum_{i=1}^b a + \sum_{i=1}^n \alpha_{1i} \Delta EG_{t-1} + \sum_{i=1}^n \alpha_{2i} \Delta GR_{t-1} + \sum_{i=1}^n \alpha_{3i} \Delta FLF_{t-1} + \sum_{i=1}^n \alpha_{4i} \Delta EPS_{t-1} + \mu_t$$

In this study, the Vector Error Correction Model (VECM) analysis will be conducted through a series of systematic and comprehensive stages. The process begins with a stationarity test using the Augmented Dickey–Fuller (ADF) or Phillips–Perron (PP) method to ensure the stability of the time series data, followed by determining the optimal lag using information criteria such as AIC, SIC, or HQ. Next, the Johansen cointegration test will be conducted to detect the existence of a long-run relationship between variables. After confirmation of cointegration, VECM model estimation will be conducted to analyze the short-term and long-term relationships between variables. The resulting model will then go through a series of diagnostic tests, including autocorrelation, heteroscedasticity, and residual normality tests, to ensure compliance with classical assumptions. Further analysis includes Impulse Response Function (IRF) to see the response of variables to shocks, as well as Variance Decomposition to measure the

contribution of each variable to the variability of other variables. To identify the direction of causality, the Granger Causality test will be applied. The results of all these steps will be interpreted thoroughly, with a focus on analyzing the long– and short–run coefficients, evaluating the speed of adjustment, and interpreting the IRF and Variance Decomposition results. The process will end with model validation through comparison with economic theory and previous empirical studies, as well as possible robustness tests if needed. Each stage will be reported in detail to ensure transparency and validity of the research results.

RESULTS AND DISCUSSION

RESULT

In this study using variables including Economic Growth, Geopolitical Risk, Female Labor Force, and Environmental Policy Stringency in Indonesia with a period of 1992 – 2022, the descriptive statistics are as follows:

Table 2. Output Statistic Descriptif

	EG	GR	FLF	EPS
Mean	4.783333	0.050000	45764.47	0.649000
Median	5.120000	0.040000	50597.00	0.330000
Maximum	8.220000	0.120000	53167.00	1.700000
Minimum	– 13.13000	0.020000	4976.000	0.170000
Std. Dev.	3.852598	0.031623	13886.16	0.513476
Skewness	– 3.626607	1.004828	– 2.586839	0.913131
Kurtosis	17.10578	2.667539	7.856444	2.465205
Jarque – Bera	314.4776	5.186562	62.93999	4.526550
Probability	0.000000	0.074774	0.000000	0.104009
Sum	143.5000	1.500000	1372934.	19.47000
Sum Sq. Dev.	430.4329	0.029000	5.59E + 09	7.646070
Observations	30	30	30	30

Source: Output

Based on the table above, it explains that the average economic growth in Indonesia which is the sample in this study during 1992 – 2022 is 4.78 with a standard deviation value of 3.85 and a probability value of 0.00. In the GR section during the 1992 – 2022 period with a value of 0.05 with a standard deviation value of 0.03 and a probability of 0.07. Furthermore, the FLF has a value of 4576.47 with a standard deviation value of 13886.16 and a probability of 0.00. And the last is EPS has a value of 0.64 with a standard deviation value of 0.51 and a probability of 0.10.

Stationary Test

The first step in the VECM model is to conduct a stationary test, using Augmented Dickey Fulley (ADF). The main requirement in the VECM model is to be stationary at level and difference 1. The results of the roots test can be seen in table 3.

Tabel 3. Stasioner Test

Variable	Level	1 Difference
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	Statistic	Prob	Statistic	Prob
Economic Growth	-4.011775	0.0043	-6.908981	0.0000
Geopolitical Risk	-2.103092	0.2449	-4.531378	0.0013
Female Labor Force	-6.095026	0.0000	-6.401768	0.0001
Environmental Policy Strigency	1.265730	0.9978	-4.774678	0.0006

Source: Eviews 12 Processed

Based on the ADF test results, the Economic growth variable passes the 1st difference level with a probability value of $0.0043 < 0.05$ which indicates that EG is stationary at the level level. The Geopolitical Risk variable passes the 2nd difference level with a probability value of $0.0013 < 0.05$ which indicates that GPR is stationary at the 1st Difference level, the Female Labor Force variable passes the 1st difference level with a probability value of $0.0000 < 0.05$ which indicates that FLF is stationary at the level level. And likewise, the Environmental Policy Strigency Risk variable passes the 2nd difference level with a probability value of $0.0006 < 0.05$ which indicates that EPS is stationary at the 1st Difference level.

Lag Criteria

After conducting stationary test at level or difference 1, the next step is to determine the best lag using lag order selection criteria. The results of determining the lag criteria can be seen in table 3, provided that the highest number of stars is considered the best lag.

Table 3. Lag Optimal

LAG	LOGL	LR	FPE	AIC	SC	HQ
0	-77.20681	NA	0.004815	6.015319	6.207295	6.072403
1	-15.41934	100.6907*	0.000165*	2.623655	3.583534*	2.909078
2	-1.183158	18.98158	0.000205	2.754308	4.482090	3.268068
3	18.95781	20.88693	0.000192	2.447570	4.943255	3.189668
4	43.17229	17.93665	0.000180	1.839089*	5.102678	2.809525*

Source: Eviews 12 Processed

Stability Test

After conducting the lag test criteria, the next step is to conduct a VAR stability test which aims to ensure that the VECM model can be forecast using IRF and VD. The main requirement for the model to be considered stable is the modulus value of less than 1, as presented in table 4.

Table 4. Test Stability

Root	Modulus
-0.028654 - 0.801529i	0.802041
-0.028654 + 0.801529i	0.802041
0.066780 - 0.627326i	0.630870
0.066780 + 0.627326i	0.630870
-0.376579 - 0.340838i	0.507920
-0.376579 + 0.340838i	0.507920
0.402224 - 0.133051i	0.423659
0.402224 + 0.133051i	0.423659

Source: Eviews Processed

Cointegration Test

The cointegration test aims to determine that there is a stable long – term relationship between two or more non – stationary variables in the time series. In this study, the cointegration test uses the Johansen Cointegration Test. Therefore, this study fulfills the VECM model because the test results show a probability value <0.05, as shown in table 5.

Table 5. Cointegration Test Results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob*
None *	0.697053	74.26949	47.85613	0.0000
At most 1 *	0.587892	40.83194	29.79707	0.0018
At most 2 *	0.301678	16.01082	15.49471	0.0418
At most 3 *	0.191634	5.956729	3.841465	0.0147

Source: Eviews Processed

Granger Causality Test

The granger causality test aims to determine the one – or two – way causal relationship between variables in the long – run relationship. Table 6, shows the results of the causality test with the provision of a probability value <0.05, so that it can be decided that there is a causal relationship between variables.

Table 6. Causality Test Results

Null Hypotesis	OBS	F-Statistic	Prob
GPR does not Granger Cause FL	30	4.18236	0.0507
FL does not Granger Cause GPR		0.11747	0.7344
EPS does not Granger Cause FL	30	2.90074	0.1000
FL does not Granger Cause EPS		0.11510	0.7370
EG does not Granger Cause FL	30	0.02314	0.8802
FL does not Granger Cause EG		0.32570	0.5729
EPS does not Granger Cause GPR	30	0.03677	0.8494
GPR does not Granger Cause EPS		0.53845	0.4694
EG does not Granger Cause GPR	30	2.00296	0.1684
GPR does not Granger Cause EG		0.62736	0.4352
EG does not Granger Cause EPS	30	0.71304	0.4059
EPS does not Granger Cause EG		0.08915	0.7675

Source: Eviews Processed

Based on the results of the causality test as listed in table 6, it shows that there is a one – way relationship between Geopolitical Risk and Female Labor Force, this finding is in line with empirical studies (Nasir and Spencer 2024) which found a unidirectional relationship between the two variables.

VECM Regression Model

The results of the VECM test in the long term and short term can be seen in Table 7. This study uses a significance level of 5% to assess the variables of economic growth, female labor force, environmental policy vulnerability, and geopolitical risk. To determine

the level of significance, researchers compared the t – statistic with the t – table of 2.045. The main requirement for variables to be considered influential is the t – statistic value > t – table value. Therefore, the VECM test results and analysis can be seen in table 7.

Table 7. Long – run and short – run VECM Tests

Variable	Coefficient	Std. Error	t-stat	Information
Long Run Results				
D(FL)	3.937816	(0.62656)	[6.28480]	Significant
D(GPR)	114.7199	(32.3243)	[3.54903]	Significant
D(EPS)	– 17.34799	(5.55419)	[– 3.12340]	Significant
Short Run Results				
CointEq1	– 0.852851	(0.63159)	[– 1.35032]	
D (FL (-1))	2.918855	(1.85035)	[1.57746]	Not Significant
D (FL (-2))	0.304726	(0.25952)	[1.17418]	Not Significant
D (GPR (-1))	– 12.97472	(99.8252)	[– 0.12997]	Not Significant
D (GPR (-2))	– 0.600491	(0.34319)	[– 1.74975]	Not Significant
D (EPS (-1))	– 6.496939	(11.8363)	[– 0.54890]	Not Significant
D (EPS(-2))	0.618173	(0.24737)	[– 2.49896]	Significant
C	– 0.001663	(0.00199)	[– 0.83585]	

Source: Eviews Processed

Based on the research results shown in Table 7, the female labor force, geopolitical risk, and environmental policy vulnerability variables have a long – term effect on economic growth in Indonesia. The first analysis starts from the female labor force variable that has a positive impact on economic growth in Indonesia. This finding indicates that a 1% increase in the female labor force will increase economic growth in the long run by 3.93%. This research is in line with empirical investigations (Akhtar et al. 2023) that better female labor participation will contribute to rapid economic growth. This is also in line with (Sinha 1965) and (Boserup 1970) The hypothesis that the long – run relationship between economic development and the female labor force follows a U – shape. The hypothesis reveals that during the early stages of economic development, female labor force participation tends to decline due to structural changes in economic development from the agricultural sector to the industrial economy, and at later stages of development, the female labor force increases as countries transition to modern economies, fertility rates decline and female education levels increase. Therefore, in Indonesia's efforts to realize sustainable economic development, women's economic empowerment and gender equality are the main pillars to achieve this target. Women are considered as important agents in poverty alleviation and sustainable economic growth. Excluding them from social and economic activities will cause problems for future generations and the economy (Taheri, Given Lisaniler, and Payaslioglu 2021).

Therefore, the sustainable development targets that seek to eliminate discrimination against women's rights are also in line with Islamic views. Islam has granted all fundamental rights to women including education and employment. Women's rights should always be guaranteed to gain gainful employment, and participate in the socio – economic life of the community (Indriso and Work 1986).

Furthermore, there is concrete evidence that geopolitical risk has a positive impact on economic growth in Indonesia. Therefore, this finding indicates that geopolitical risk has a significant influence on economic growth. This finding is in line with research (Saint Akadiri et al. 2020) that geopolitical risks have a real impact on economic growth in the

long run. This is also affirmed in the investigation (Kapopoulos, Sakkas, and Drakos 2024) that geopolitical frictions, tensions, or even events such as elections create uncertainty in the political scene and have a significant impact on economic performance. In theory, geopolitical risk as expressed by (Caldara and Iacoviell 2022) that the multiple channels of the geopolitical landscape are critical to the progress of economic development and even sustainable development. At the macro level, geopolitical risks arising from social instability and humanitarian crises often lead to displacement, inequality and social unrest. Therefore, understanding the phenomenon of geopolitical risks, improving the quality of governance is increasingly important today to offset the adverse impacts of such risks (Nguyen et al. 2023).

Study (Qin et al. 2023) It is evident that in achieving sustainable economic development, extreme geopolitical risks may hinder sustainable development. Because this results in a weakened global production supply chain system. Realizing the portrait of international political disputes that have heated up in the last decade, the concept of *fiqh al hadarah*, which concerns the basic ideas of diplomacy in realizing peace, is increasingly important today to be discussed. The idea is a constructive reference in responding to changes that occur at the national and global levels. The substance of the idea is to counteract the spread of hatred between groups, support solidarity, and mutual respect for differences between humans, cultures, and nations in the world and encourage the birth of a just and harmonious world order (Rois and Masrury 2023).

The results further reveal that environmental policy stringency has a negative and significant effect on economic growth. This is evidenced by the coefficient value of -17.3 . This finding underscores that the complexity of environmental policy and economic growth, always involves a trade-off between environmental protection, economic costs, and long-term benefits. Similarly, countries with strict environmental policies often face a decline in international competitiveness if production costs increase compared to countries with more relaxed regulations. Therefore, this study emphasizes the importance of striking the right balance for long-term environmental and economic growth today. This is also evidenced by empirical studies (Grossman and Krueger 1991) that increased industrialization to spur a country's economic development often causes environmental damage at first, but after reaching a certain threshold, environmental quality should improve with further economic growth. This pattern illustrates that the evolution of a country transitioning from an industrialized society requires a balance between economic development and environmental policy.

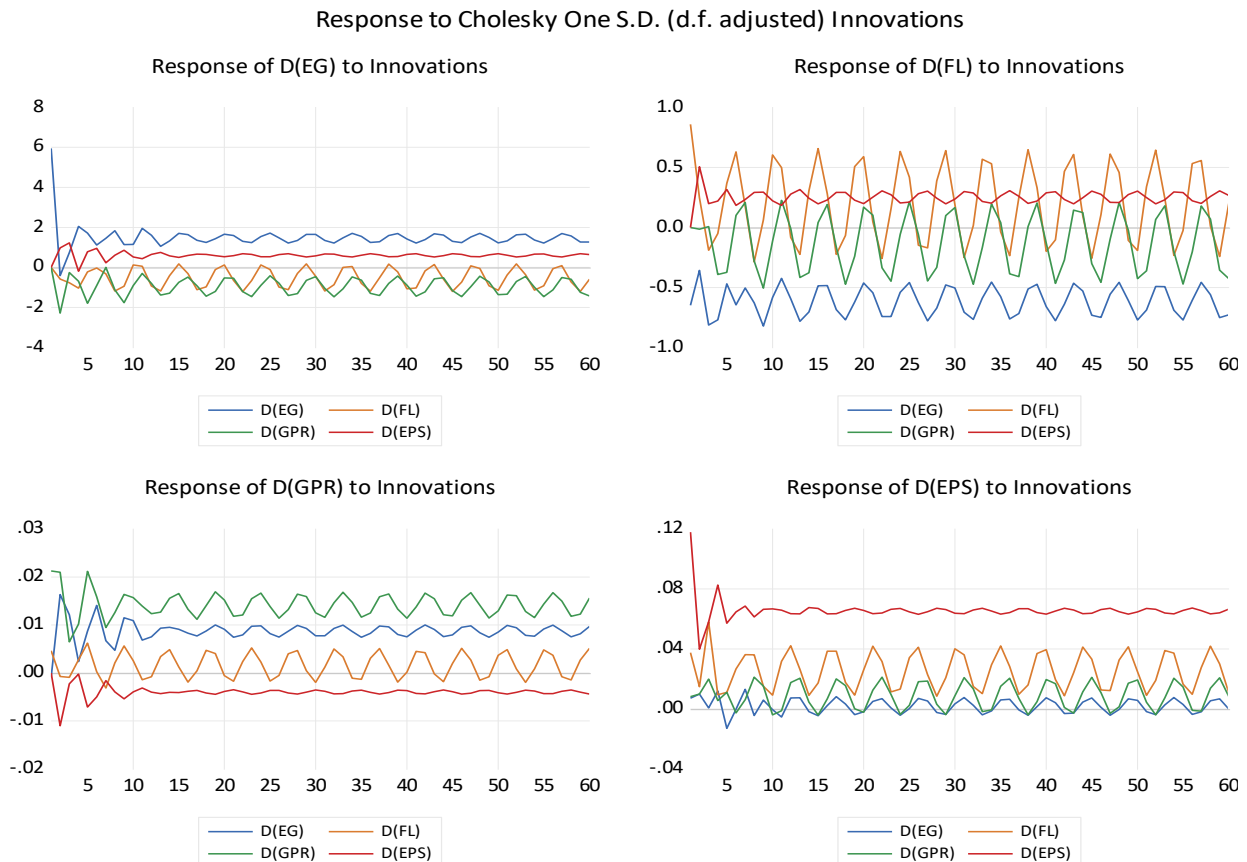
Similarly, the Shariah directive to protect the environment states that in order to realize the maintenance, protection and preservation of the environment, which is diverse in type, it should be adjusted to the nature of each element of the environment, and its relationship with humans and their needs for this element (Jalamneh et al. 2024).

The next discussion, this study reveals the impact in the short term, that the variable environmental policy stringency with economic growth. However, the finding is quite surprising that a 1% increase in environmental policy leads to a -2.49 increase in economic growth. These results suggest that strict environmental policies can encourage firms or to encourage investment in the use of environmentally friendly green technology. Strict environmental policies trigger firms to increase the efficiency of resource use and reduce waste. This finding is in line with research (Murshed et al. 2021) that environmental regulations can reduce the impact of economic development. However, environmental policies do not necessarily hamper the country's economic development. In fact, green programs or active environmental policies will create new jobs in sectors such as renewable energy, waste management, and changes in vehicle usage patterns that

are environmentally friendly. These policies will create new economic opportunities for companies while mitigating the impact of environmental risks (Martos et al. 2016).

IRF dan IFD

The next analysis is related to the impulse response which aims to observe the effect of shocks from one variable to another. Impulse response will provide a detailed description of the relationship of the magnitude of the influence between the estimated period of the variable will reach a stable level. as for the results of the analysis can be observed below:



The processing results in the form of IRF graphs as shown in Figure 2, show the shocks from the economic growth variable and the response of other variables. at the beginning of the period until the end, shows a fluctuating shock. Since the beginning of the period, there is a negative response of around 0.01. However, the long – term period (60) began to show positive changes and more stable. This shows that it is important for economic growth policies to take into account three aspects such as geopolitics, labor, and environmental policies to achieve sustainable economic development targets.

Focusing on geopolitical situations, labor, and environmental policies, the Islamic perspective offers a comprehensive approach. Islam teaches that economic development should create general welfare (*maslahah*), uphold the dignity of labor, and preserve natural resources as essential components of economic progress. In the long term, this approach not only aims to achieve sustainable economic growth but also seeks to realize an Islamic worldview of a society that integrates economic and ecological balance (Al–Jayyousi 2018)

Then, the next observation is the response of the female labor force to economic growth which shows very fluctuating results. this can be seen from the initial period to the last period shows a very powerful shock. These results indicate that the contribution of the female labor force to economic growth is still considered sensitive. The portion for the male labor force will be greater for economic development if seen from the impulse

response picture. This fact, too, has always been highlighted by economist Todaro that the inequality of the female labor force in various countries is still very high. most of the female workforce has the status of family workers / unpaid. Likewise, in the records of the Indonesian statistics center that the level of female labor participation in Indonesia reached 53%, far below male participation which reached around 82%. This fact cannot be separated from the domestic role of women who mostly take care of the household.

In the context of Islamic studies, we can emphasize the importance of equality and justice principles in Islam that support women's empowerment in the workforce. Islam not only values the significant role of women in the workplace but also encourages their involvement in economic development, provided it does not interfere with their family duties and responsibilities. However, the IRF analysis shows that female workers face considerable challenges in achieving equal participation. Islam advocates for fair policies that ensure equal opportunities and support for both men and women. This includes providing women access to decent work and fair treatment, particularly in terms of wages, which remains a pressing issue today (Jajang, Nur Rianto 2021).

The next analysis is the response of the geopolitical risk variable which shows positive results reaching around 2.1. Since the beginning of the period, geopolitics showed a strong shock until the end of the period. Then, if analyzed more carefully, the geopolitical risk variable is responded by environmental policy risk. These results suggest that there is a complex relationship between global geopolitical threats and their influence on environmental policy. In theory, global political uncertainty can threaten the state of the country's economy and labor recruitment.

On the other hand, Islam emphasizes that global security and peace are essential prerequisites for achieving sustainable prosperity, including economic and environmental sustainability. The Qur'an, as a central guideline, provides teachings on international relations as a form of human brotherhood that encompasses all of humanity. Therefore, in facing geopolitical risks, Islam encourages people to act responsibly and prioritize wisdom in preserving nature. Nature should not be exploited solely for the interests of specific groups but rather respected as a responsibility entrusted to humanity to protect it as a gift from God (Gade 2023).

Furthermore, shocks to the environmental policy stringency variable show signs of stabilizing in the 60th period. In addition, it can be observed that this variable is responded to by positive economic growth. Of course, with this result, it illustrates that an increase in the strength of strict environmental policies will increase sustainable economic development. One of the main highlights in the dynamics of modern economic development is that it focuses more on growth alone, but less concern for environmental risks. Of course, this phenomenon is very dangerous if it is not overcome by strict environmental policies in order to realize sustainable economic development by integrating eco – friendly policies.

Islamic principles on environmental issues consistently emphasize not only the dangers of environmental damage due to exploitation for economic development but also the importance of using and managing resources in a reasonable and balanced way. This approach ensures that economic growth derived from nature is achieved sustainably, without causing harm to anyone (Shihab 2023:31).

Table 8. Variance Decomposition Economic Growth

Response of D(EG): Period	D(EG)	D(FL)	D(GPR)	D(EPS)
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1	5.944930	0.000000	0.000000	0.000000
2	-0.405768	-0.578899	-2.288380	0.978784
3	0.733486	-0.765707	-0.259419	1.229555
4	2.046946	-1.040252	-0.695235	-0.197694
5	1.708733	-0.224391	-1.797330	0.778378
6	1.114349	-0.033827	-0.913189	0.958951
7	1.458210	-0.324569	0.000257	0.232933
8	1.831159	-1.183191	-1.119908	0.609946
9	1.138326	-0.939720	-1.759688	0.858470
10	1.150929	0.124500	-0.907247	0.518057

Source: Eviews Processed

The next explanation in Table 8, is the variance decomposition of Economic Growth shows a contribution of 5.94% in the first period. Furthermore, if observed in detail, the short-term period (4th) shows the biggest shock since 10 periods. This is confirmed by a value of 2.04%. However, in the long term, it began to show a significant decline even though it was fluctuating and followed by other variables.

Table 9. Variance Decomposition Female Labor Force

Response of D (FL): Period	D(EG)	D(FL)	D(GPR)	D(EPS)
1	-0.649133	0.858799	0.000000	0.000000
2	-0.358068	0.246613	-0.015211	0.504626
3	-0.813475	-0.190927	0.005588	0.197468
4	-0.770639	-0.050681	-0.392878	0.219984
5	-0.469801	0.366964	-0.375156	0.314804
6	-0.645736	0.629643	0.100273	0.183044
7	-0.503848	0.175869	0.207379	0.232287
8	-0.629584	-0.287758	-0.280491	0.291256
9	-0.821776	0.062150	-0.506892	0.293365
10	-0.583115	0.604164	-0.114035	0.220889

Source: Eviews Processed

The next analysis, the forecast error variance decomposition (FEVD) observation, as shown in Table 9, shows the impact of the female labor force over 10 periods. The initial period shows a very large shock of 0.85%. However, if observed further, this variable experienced a significant decline until the final period which reached 0.60%. This also happened to the geopolitical risk variable which experienced a significant decline of around -0.11%.

Table 10. Variance Decomposition Geopolitical Risk

Response of D (GPR): Period	D(EG)	D(FL)	D(GPR)	D(EPS)
1	-0.000860	0.004625	0.021265	0.000000
2	0.016321	-0.000747	0.020980	-0.010984

3	0.012158	-0.000916	0.006503	-0.002284
4	0.002401	0.002757	0.010212	-0.000248
5	0.008693	0.006213	0.021167	-0.007116
6	0.014059	0.000238	0.015866	-0.004963
7	0.006728	-0.003149	0.009493	-0.001614
8	0.004731	0.002122	0.012603	-0.003964
9	0.011519	0.005640	0.016361	-0.005381
10	0.010894	0.002550	0.015720	-0.003929

Source: Eviews Processed

Further discussion can be observed in Table 10, which displays the geopolitical risk variable shocks. In the first period, this variable experienced a very large shock of around 0.21%. However, in the final period, geopolitical risk began to experience a significant decline, reaching 0.15%. This also happened to the environmental policy stringency variable which reached -0.003.

Table 11. Variance Decomposition Enviromental Policy Strigency

Response of D(EPS): Period	D(EG)	D(FL)	D(GPR)	D(EPS)
1	0.007216	0.037489	0.008206	0.117950
2	0.009986	0.014781	0.009910	0.039818
3	0.000696	0.058069	0.019883	0.058122
4	0.011942	0.009553	0.005576	0.082606
5	-0.012888	0.011067	0.011138	0.057239
6	-0.000250	0.026662	-0.002677	0.064724
7	0.013105	0.036225	0.006190	0.068546
8	-0.004425	0.036036	0.021203	0.061402
9	0.005908	0.015171	0.015288	0.066395
10	-0.000435	0.009167	-0.003946	0.066719

Source: Eviews Processed

The results of the variance decomposition analysis of the environmental policy stringency variable show fluctuating shocks. However, this variable is not much different from other variables in the short term (period -1) experiencing a very large shock (0.11%).

Reaffirming the realization of sustainable development with a focus on economic growth from an Islamic perspective requires highlighting the principles of balance, justice, and sustainability, which are central to Islamic teachings. When Indonesia prioritizes economic growth, it should consider the welfare of all societal layers, including fostering a productive workforce, reducing inequality, and addressing environmental impacts. It is essential to recognize that economic development aimed at fulfilling human needs should not be limited to physical necessities alone but also include non-physical or spiritual dimensions. Thus, the concept of Islamic economics encompasses not only meeting human needs in this world but also ensuring well-being in the hereafter (Arie 2015).

Economic development should be based on universal ethics, morals, and humanity to reflect both physical and spiritual well-being and prosperity. By emphasizing these aspects in Islam, the fulfillment of women's rights, ecological balance, and a stable political environment are expected to guide economic policies that are not only growth-oriented but also focused on long-term welfare, thereby fostering inclusive development that aligns with Islamic values.

CONCULSSION

This study evaluates and analyzes the relationship between economic growth priorities and the achievement of sustainable development in Indonesia by considering the impact of the female labor force, geopolitical risk, and environmental policy vulnerability and using the VECM approach. The results of the analysis show that the female labor force, geopolitical risk, and environmental policy stringency have a long-run effect on economic growth. This shows that policies that prioritize environmental sustainability, and fulfillment of women's rights and strengthening institutional governance have a significant impact on economic development.

Meanwhile, in the short-term test results, it shows that Environmental policy stringency consistently affects economic growth in Indonesia. This is evidence that the importance of strict environmental policies should be considered even though most consider that these measures hinder economic development. However, these results should be utilized by stakeholders to create new economic opportunities and increase employment capacity. Thus, this research makes an important contribution in understanding sustainability-focused economic growth policies to support sustainable development in Indonesia by integrating social, environmental, and political aspects. The research therefore recommends multidimensional measurement of economic, social, and environmental progress to ensure that all aspects of sustainability are effectively integrated in policy strategies.

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