Al-Kharaj: Journal of Islamic Economic and Business
Volume 8 (3), 2026
P-ISSN: 2686-262X; E-ISSN: 2685-9300

The Impact of Green Bond, Sukuk, and Zakat on Indonesia's Economic Growth

Ella Rahma Putri[1], Renny Oktafia[2]
[12]UPN Veteran Jawa Timur, Indonesia
Email: renny.oktafia.es@upnjatim.ac.id

Keywords:
Green Bond, Sukuk, Zakat, Economic Growth, ECM

Abstract

Economic growth in Indonesia is predominantly driven by household expenditure, while investment, the second largest component of GDP, has declined over the past several years. At the same time, environmental degradation, climate change, and limited Islamic finance highlight the need for more sustainable alternative financing sources, such as green bond, sukuk, and zakat. This study aims to examine the impacts of green bonds, sukuk, and zakat on Indonesia's economic growth during the 2018–2025 period. A quantitative approach was employed using quarterly secondary data and examined through the ECM (Error Correction Model) with EViews 13 software. The results indicate that green bonds, sukuk, and zakat have an insignificant impact on economic growth in the short run. But, in the long run, green bonds, sukuk, and zakat have positive and significant impacts on economic growth. These results demonstrate that green finance and Islamic finance play important roles in economic growth, although the benefits of green bonds and zakat require time to materialize. Therefore, the government and relevant stakeholders should strengthen the green bonds and sukuk regulation while optimizing the collection and productive distribution of zakat to support Indonesia's inclusive and sustainable economic growth.

INTRODUCTION

Economic growth serves as a key measure of economic development in a country because it reflects improvements in production capacity, income, employment opportunities, and overall social welfare (Gai et al., 2024; N. Hidayat et al., 2025; Nurhayati et al., 2024). In recent years, economic growth has been severely affected by various shocks in both developed and developing countries (IMF, 2021). These shocks include the COVID–19 pandemic, contractionary monetary policies, geopolitical tensions, and global economic uncertainty, all of which have disrupted supply chains, production, purchasing power, and other structural aspects of the economy (Bratakusumah, 2026; IMF, 2023; Zaza et al., 2025). These conditions pose a challenge in maintaining the stability and sustainability of economic growth.

As one of the largest emerging economies in Southeast Asia, Indonesia has successfully maintained economic growth at around 5% following the COVID-19 pandemic, despite experiencing a contraction of –2.07% during the crisis (BPS, 2025; Rusmini et al., 2023). Nevertheless, its economic growth remains predominantly driven by household consumption (Bank Indonesia, 2025b). According to BPS (2025), household consumption accounted for more than 50% of GDP throughout 2018–2025 period. In contrast, the contribution of Gross Fixed Capital Formation (GFCF), an investment indicator, declined from 32.28% in 2018 to 28.75% in 2025. This trend indicates that Indonesia's economy remains highly dependent on domestic consumption, while investment has yet to play an optimal role as a long–term engine of economic

growth. Consequently, alternative finance is necessary to enhance investment, strengthen the real sector, improve the economic structure, and support sustainable economic development (Martain, 2026).

In addition to economic challenges, Indonesia continues to face serious environmental degradation and climate change issues. According to the Indonesia Deforestation Status Report 2025, approximately 433,751 hectares of forest were lost, representing a 66% increase compared with the previous year (Auriga Nusantara, 2025; Batani & Suparman, 2026). Furthermore, Indonesia ranks among the world's ten largest carbon emitters and is the third most disaster–prone country globally, with increasing hydrometeorological disasters driven by climate change (Ardiansyah et al., 2025; World Risk Report, 2025). In response, Indonesia has committed to addressing environmental challenges through Paris Agreement and Sustainable Development Goals (SDGs), while targeting Net Zero Emissions (NZE) by 2060 and integrating environmental sustainability into its national development agenda (Hulu et al., 2024; Mara et al., 2025).

Achieving these commitments requires substantial financial resources to support environmentally sustainable development and the transition toward a green economy (Suparman, 2023). Consequently, Indonesia has promoted green bonds as an innovative financing instrument for green projects (IRENA, 2020; OJK, 2016). The outstanding value of green bonds increased significantly from USD 1,300 million in 2018 to USD 17,497 million in 2025. During the COVID-19 pandemic, green bonds remained relatively stable compared with many conventional financial instruments. However, Indonesia's green bond market remains nascent with lower market penetration than many other countries (Prisandy & Widyaningrum, 2022). Moreover, investors' understanding of green bonds remains limited, making their contribution to economic growth an important subject for further empirical investigation (Cendekiawan & Firmansyah, 2024).

As a country with the largest Muslim population in the world, where approximately 87% of its citizens adhere to Islam, Indonesia has substantial potential to develop Islamic finance (World Population Review, 2026). Sukuk is an Islamic finance instrument that has developed significantly and provides financing for infrastructure development and the real sector. In Indonesia, corporate sukuk have experienced notable growth. During the COVID-19 pandemic, while the Indonesia Composite Index (IHSG) declined to approximately IDR 3,900, the outstanding value of corporate sukuk continued to increase from IDR 16,804 billion to IDR 37,000 billion (Prasetyo et al., 2025). Nevertheless, this growth has not been accompanied by a substantial increase in market share, as corporate sukuk accounted for only 16% of the total outstanding bonds and sukuk in Indonesia in 2025 (IDX, 2025). In addition, Islamic financial literacy and inclusion remain relatively low, with an Islamic financial inclusion rate of only 13.41%, compared with 79.71% for conventional financial inclusion (OJK, 2025). These findings suggest that corporate sukuk continue to play a relatively limited role compared with sovereign sukuk and conventional bonds, highlighting the need for further empirical evidence regarding their contribution to economic growth.

Beyond commercial Islamic finance, Islam also provides social finance instruments. Zakat is a principal instrument of Islamic social finance that promotes income redistribution, alleviate poverty, and improve social welfare (Hassan et al., 2021). Indonesia continues to face socioeconomic challenges, with a poverty rate of 8.47% and a Gini ratio of 0.363, indicating persistent income inequality (BPS, 2026b, 2026a). In this context, effective zakat collection and distribution play an essential role in addressing these issues. According to BAZNAS (2025), the estimates zakat potential in Indonesia amounts to IDR 326.7 trillion. However, zakat distribution

in Indonesia amounted to only IDR 283 billion in 2025. However, actual zakat distribution amounted to only IDR 283 billion in 2025. This considerable gap reflects the suboptimal collection, management, and distribution of zakat funds, as well as limited public awareness of official zakat institutions. Consequently, further research is required to examine the role of zakat as an Islamic social finance instrument in promoting Indonesia's economic growth.

Previous studies suggest that green bonds, sukuk, and zakat have an impact on economic growth by increasing investment, strengthening the real sector, and improving welfare distribution. Nghiem et al. (2026) and Manasseh et al. (2026) found that green finance, represented by green bonds, positively influences economic growth in the short and long run across developing and Asian economies. However, Siahaan et al. (2025) found that green bonds have an insignificant impact on economic growth in European Union countries. Similarly, several studies have found that sukuk positively and significantly contribute to economic growth (Hidayat & Laksamana, 2024; Safitri et al., 2025; Ulfa & Roosmalitasari, 2022). In contrast, Alvionita (2021) and Safitri et al. (2024) reported insignificant results, which they attributed to the suboptimal allocation of sukuk funds for infrastructure development and investment projects.

Empirical findings regarding zakat are also mixed. Zaky & Badriyah (2024) and Siswantoro & Ikhwan (2023) found that zakat positively affects long-term economic growth by increasing household consumption. Likewise, Diana et al. (2026) demonstrated that the distribution of Zakat, *Infaq*, and *Sadaqah* (ZIS) effectively reduces poverty and promotes economic growth. However, other studies concluded that zakat has an insignificant direct or short–run impact on economic growth due to its underutilized potential and ineffective utilization (Azzahra et al., 2025; Choris et al., 2026; Miftahuda & Galuh, 2025)

However, several research gaps remain in existing literature. Most past research have examined green bonds, sukuk, and zakat separately or have combined only one or two of these instruments. Consequently, existing studies have not provided a comprehensive understanding of how these three financing instruments jointly contribute to Indonesia's economic growth. Moreover, the inconsistent findings reported in previous studies indicate that the impacts of green finance and Islamic finance on economic growth requires further empirical analysis.

To address these gaps, this study offers several contributions. First, it integrates green bonds, sukuk, and zakat into a unified analytical framework to examine their combined effects on economic growth. Second, it employs quarterly data covering the 2018–2025 period, including before, during, and after the COVID–19 pandemic, thereby capturing dynamic behavior of these financial instruments under different economic conditions. Third, this study applies to the ECM (Error Correction Model) to distinguish between short run and long run impact of green bonds, sukuk, and zakat on economic growth. Accordingly, this research aims to examine the impact of green bonds, sukuk, and zakat on economic growth in Indonesia.

METHODS

This research adopts a quantitative research approach to analyze the impact of green bonds, sukuk, and zakat on economic growth in Indonesia. This analysis uses quarterly time–series data for the 2018–2025 period, representing Indonesia's economic conditions throughout the study period. The data are secondary in nature and were collected using the documentation method through downloading, recording, and processing data obtained from the official websites of relevant institutions, including Statistics Indonesia, Indonesia Financial Services Authority (OJK), AsianBondsOnline, and Indonesia National Zakat Agency (BAZNAS).

This research uses saturated sampling, in which all population is included as the research sample, resulting in a total of 32 quarterly observations (Sugiono, 2017). The dependent variable is economic growth (Y), represented by Gross Domestic Product (GDP). The independent variables consist of green bonds (X_1), sukuk (X_2), and zakat (X_3). The operational definitions of the variables in **Table 1**.

Table 1 Data Sources

Variable	Indicator	Source
Green Bond (X1)	*Oustanding Green Bond* in Indonesia	AsianBondOnline
Sukuk (X2	*Outstanding* Corporate Sukuk in Indonesia	OJK
Zakat (X3)	Zakat Distribution in Indonesia	BAZNAS
Economic Growth (Y)	Gross Domestic Bruto (GDP) Constan Prices by Expenditure in Indonesia	BPS

Source: Researcher's processing (2026)

The data analysis employed the ECM (Error Correction Model) with the assistance of EViews 13 software. According to (Gujarati & Porter, 2009), the long run regression function is formulated as follows:

$$\boldsymbol{Y_t = a_0 + a_1 X1_t + a_2 X2_t + a_3 X3_t}$$

Based on the long run, the short run regression is formulated as follows:

$$\boldsymbol{D(Y)_t = \beta_0 + \beta_1 D(X1)_t + \beta_2 D(X2)_t + \beta_3 D(X3)_t + u_t}$$

Note:

Y_t = Economic growth at period t
$X1_t$ = Green bond at period t
$X2_t$ = Sukuk at period t
$X3_t$ = Zakat at period t
D = Changes at first difference level
β_0, a_0 = Constanta
β_1, β_2, β_3, a_1, a_2, a_3 = coefficients regression
u_t = error correction term

Before estimating the ECM, the regression model was evaluated through classical diagnostic testing (Ghozali & Ratmono, 2017). These tests include:

(1) Normality test: probability value Jarque–Bera (JB) > 0.05.
(2) Multicollinearity test: the Variance Inflation Factor (VIF) < 10.
(3) Heteroskedasticity test: probability value Breusch–Pagan test > 0.05.
(4) Autocorrelation test: probability value LM test > 0.05 or Durbin–Watson (DW) statistic satisfying the criterion (DU ≤ DW ≤ 4–DL)

After the data satisfy the classical assumption tests, stationarity test uses Augmented Dickey–Fuller (ADF), followed by the Engle–Granger (EG) cointegration test to verify long–run equilibrium. The ECM is subsequently employed to estimate short–run and long–run impact of

green bonds, sukuk, and zakat on economic growth. Finally, hypothesis test using the coefficient of determination (R^2), F–test, and t–test at a 5% significance level (Ajija et al., 2011).

RESULTS AND DISCUSSION

RESULTS

Classical Diagnostic Test

This tests using the Ordinary Least Squares (OLS) method to ensure that the regression model satisfies the Best Linear Unbiased Estimator (BLUE) assumptions. The tests included normality, multicollinearity, heteroskedasticity, and autocorrelation tests.

Table 2 Classical Diagnostic Test Results

No	Classical Diagnostic Test	Result	Interpretation
1	Normality Test	Probability Jarque–Bera (JB) 0.901981 > 0.05	Residuals are normally distributed.
2	Multicollinearity Test	X1; X2; X3 Centered VIF value = 4.458; 4.332; 2.962 < 10	No multicollinearity
3	Heteroscedasticity Test	Prob. Chi–Square value = 0.7096 > 0.05)	No heteroskedasticity
4	Autocorrelation Test	Durbin Watson = 1.841, so DU ≤ DW ≤ 4–DL 1.6503 ≤ 1.8419 ≤ 2.8195	No autocorrelation based on the Durbin–Watson criterion

Source: Source: Data processed, 2026

The results indicate the regression model fulfills all classical assumptions. The Jarque–Bera (JB) test shows the model is normally distributed, as the probability more than 0.05 (0.901981 > 0.05). The multicollinearity test demonstrates all independent variables have VIF value below 10, indicating the absence of multicollinearity (green bond = 4.458, sukuk = 4.333, and zakat = 2.963). The Breusch–Pagan–Godfrey test confirms that the model does not suffer from heteroskedasticity, with a probability value of 0.7096 (> 0.05). Although the Durbin–Watson stat = 1.8419 falls within the acceptance region (DU ≤ DW ≤ 4 − DL), it's indicated the model no autocorrelation problem. Therefore, the model of regression fulfills the classical assumptions and proper for the next analysis.

Stationarity Test

Stationarity test was conducted to ensure the mean and variance of the data remain stable over time. This procedure always uses for time–series analysis to avoid spurious regression. Stationarity was examined using ADF value unit root test at both the level and first–difference levels.

Table 3 Results of the Stationarity Test

Variable	Level		First Difference	
	Prob.	Interpretation	Prob	Interpretation
LOG_X1	0.2023	Non-stationary	0.0000	Stationary
X2	0.9356	Non-stationary	0.0000	Stationary
X3	0.7973	Non-stationary	0.0000	Stationary
Y	0.9458	Non-stationary	0.0000	Stationary

Source: Data processed, 2026

The ADF test at the level indicates that all variables have probability values greater than 0.05, implying that green bonds (X_1), sukuk (X_2), zakat (X_3), and economic growth (Y) are non-stationary. Therefore, the variables were tested again at the first-difference level. The results show that all variables become stationary with probability values of 0.0000 (< 0.05). Accordingly, all variables are integrated of first–difference level and satisfy the prerequisite for cointegration testing.

Cointegration Test

The cointegration test to examine long–run equilibrium from the model regression. The Engle–Granger (EG) cointegration test was initially employed by applying the ADF test to the residuals of the long–run regression.

Table 4 Engle–Granger Cointegration Results Test

Prob.	Interpretation
0.0069	No cointegration

Source: Data processed, 2026

The Engle–Granger test produced a probability value of 0.0069 (> 0.05), indicate that a long–run cointegrating relationship among the variables.

Error Correction Model (ECM)

Following the cointegration test, ECM estimated using the OLS method to examine the short run and long run impact of independent variables on economic growth.

Table 5 Results of ECM Test

Variable	Short Run			Long Run		
	Coefficient	t–statistic	Prob.	Coefficient	t–statistic	Prob.
C	13857.39	0.943504	0.3541	1663830.00	5.617898	0.0000
LOG_X1	27110.80	0.313514	0.7564	93764.68	2.355452	0.0257
X2	6.031600	2.045837	0.0510	9.088375	5.455025	0.0000
X3	2.281504	1.648337	0.1113	6.302418	2.348354	0.0261
ECT	-0.372473	-2.932601	0.0069			

Source: Data processed, 2026

The estimated long–run and short–run equation is:

$$\mathbf{Y = 1.663.830,00 + 93764,68(X1) + 9,088375(X2) + 6,302418(X3)}$$

$$\boldsymbol{Y = 13.857,39 + 27.110,80(X1) + 6,031600(X2) + 2,281504(X3) - 0,372473ECT}$$

The ECM estimation indicates positive coefficients for all explanatory variables in the short and long run. Economic growth (Y) shows a positive value of 13,857.39; 1,663,830 in the short run and long run when independent variable is constant. In the short run, the coefficients of green bonds, sukuk, and zakat are 27,110.80; 6.031600; 2.281504, respectively, suggesting that increases in these variables are associated with higher economic growth. Similarly, the long run coefficients of 93,764.68; 9.088375; and 6.302418 indicate that green bonds, sukuk, and zakat contribute positively to Indonesia's economic growth over time. The ECT is negative (-0.372473) and significant (p = 0.0069), indicates that 37.25% of short–run disequilibrium is adjusted toward the long–run equilibrium in each period.

Hypothesis Testing

Hypothesis testing was performed using the coefficient of determination (R^2), the F-test, and the t-test to evaluate the explanatory power of the model and the significance of the independent variables.

Table 6 Coefficient of Determination

Long Run		Short Run	
R–squared	0.929772	R–squared	0.354399
Adjusted R–squared	0.922247	Adjusted R–squared	0.255075

Source: Data processed, 2026

Adjusted R^2 value for the short run is 0.255075, indicating that 25.51% of the variation in economic growth can be explained by green bonds (X1), sukuk(X2), and zakat(X3), while the remaining 74.49% is explained by other factors outside the model. In contrast, the long run has an adjusted R^2 of 0.922247, implying that 92.22% variation in economic growth is explained by green bonds(X1), sukuk(X2), and zakat(X3), with only 7.78% attributable to other factors.

Table 7 Results of F-Test

F–table	Long Run		Short Run	
2,95	F–statistic	123.5664	F–statistic	3.568134
	Prob(F–statistic)	0.000000	Prob(F–statistic)	0.018979

Source: Data processed, 2026

The F–test results indicate the regression model is significant in the short and long run. Since the probability values are below the 5% significance level, green bonds(X1), sukuk(X2), and zakat(X3) have a significant impact on Indonesia's economic growth.

Table 8 Results of t-Test

Variable	t–table	Short Run		Long Run	
		t–statistic	Prob.	t–statistic	Prob.
C	1.70113	0.943504	0.3541	5.617898	0.0000
LOG_X1	1.70113	0.313514	0.7564	2.355452	0.0257
X2	1.70113	2.045837	0.0510	5.455025	0.0000
X3	1.70113	1.648337	0.1113	2.348354	0.0261
ECT	1.70113	-2.932601	0.0069		

Source: Data processed, 2026

The t–test results reveal different impacts across the short and long run. Green bonds (X_1) insignificant impact on economic growth in the short run ($p = 0.7564>0.05$), but they have a positive and significantly impact in the long run ($p = 0.0257<0.05$). Sukuk (X_2) insignificant impact on economic growth in short–run ($p = 0.0510>0.05$) and long–run has a positive and significant ($p<0.01$). Likewise, zakat (X_3) insignificantly on economic growth in the short run ($p = 0.1113>0.05$), but zakat has a positive and significant long–run impact ($p = 0.0261< 0.05$). Overall, the results support the proposed hypotheses. Green bonds, sukuk, and zakat contribute to Indonesia's economic growth during 2018–2025. However, the impact of green bonds, sukuk and zakat become significant only in the long run.

DISCUSSION

The Impact of Green Bond on Economic Growth

The empirical results indicate that green bonds have insignificantly impact on economic growth in the short run. However, green bonds have a positive and significant impact in the long run. These results suggest that the economic benefits of green bond financing require time to

materialize. Approximately 80% of green bond proceeds in Indonesia are allocated to renewable energy, environmentally friendly transportation, waste management, and sustainable infrastructure projects. These projects typically involve lengthy planning, construction, and operational phases before generating measurable improvements in production capacity and Gross Domestic Product (GDP) (Bank Indonesia, 2025a). Furthermore, Indonesia's green bond market remains dominated by sovereign issuances, while corporate green bonds account for only a small proportion of the market. Compared with conventional bonds and corporate sukuk, the overall market share of green bonds also remains relatively limited.

The insignificant short–run impact is consistent with Investment Theory proposed by Keynes (1936), which argues that increased investment stimulates aggregate demand through the multiplier effect, thereby accelerating economic growth (Fatmawati et al., 2025). From this perspective, investment mobilized through green bonds should immediately contribute to higher economic growth. However, this results consistent with Gull et al. (2023), Siahaan et al. (2025), and Jenia & Merietza (2025) who found that green bonds do not significantly influence short–run economic growth. This result may be attributed to the relatively low issuance volume, the distinct characteristics of the green bond market compared with conventional bond markets, the limited maturity of the green finance market, and the substantial investment and structural adjustments required for green economy transition.

In long run, green bonds have a positive and significant impact on economic growth. This result supports the Endogenous Growth Theory proposed by Romer (1990), which emphasizes that investment in capital, innovation, and technological advancement is a key of sustained economic growth (Prastiwi et al., 2025). Green bonds not only expand productive capacity but also encourage productive investment, improve energy efficiency, accelerate the adoption of environmentally friendly technologies, and create green jobs. These mechanisms strengthen the real sector, enhance long-term productivity, and promote environmentally sustainable and inclusive economic growth (ICMA, 2025; IRENA, 2020; SMI, 2023). Consequently, the economic contribution of green bonds becomes more evident after financed projects are completed and begin generating value added for the economy.

These findings are further supported by the Sustainable Development Bond and Green Bond Report from World Bank (2021), which highlights that green bonds are long–term financing instruments designed to strengthen both economic development and environmental sustainability. Moreover, the increasing green bonds issuance and implementation in multiple sustainable projects in Indonesia. It is demonstrated the government commitment to accelerating the transition toward a low–carbon economy and achieve the Sustainable Development Goals (SDGs). Therefore, although green bonds do not generate immediate economic benefits, they have an important role to supporting sustainable economic growth over the long term. This conclusion supported Nghiem et al. (2026), Joyonegoro et al. (2023), Zhou & Guo (2026), and Sharma et al. (2025) who found that green bonds contribute positively to long-run economic growth by stimulating investment, fostering sustainable innovation, and supporting the continuous development of sustainable infrastructure.

The Impact of Sukuk on Economic Growth

The empirical findings indicate that sukuk has insignificantly impact on economic growth in the short run. However, sukuk have a positive and significant impact on Indonesian's economic growth in the long run. These findings suggest that the economic benefits of sukuk financing

require time to materialize. In Indonesia, the contribution of corporate sukuk remains relatively limited, accounting for only around 16% of total outstanding bonds and sukuk. Moreover, the relatively low level of Islamic financial inclusion, at approximately 13% compared with 79% for conventional financial inclusion, may constrain the development and demand for sukuk in the short run. In addition, funds raised through sukuk are generally allocated to infrastructure, real–sector activities, and productive projects whose economic benefits require time to affect national output.

In the short run, these findings support Investment Theory by Keynes (1936), that investment decisions depend on the expected rate of return from capital relative to its cost (Hia, 2025). Therefore, an increase in sukuk does not necessarily translate immediately into higher output because the financed projects require time to be realized and generate returns. The multiplier effect of investment also occurs gradually through increases in income, consumption, and aggregate demand. As investment is realized and economic activity increases, sukuk can enhance national output and ultimately contribute to economic growth. In contrast, the result consistent with Miftahuda & Galuh (2025) and Alvionita (2021), who found that sukuk does not significantly influence short–run economic growth. This result is associated with the relatively limited contribution of corporate sukuk compared with conventional bonds and the time required for sukuk- to generate economic impact.

In the long run, sukuk has a positive and significant impact on economic growth. This finding consistent with Endogenous Growth Theory by Romer (1990), which identifies investment and innovation as key drivers of productivity and sustained economic growth (Prastiwi et al., 2025). Sukuk represent an innovative Islamic financial instrument whose proceeds are directly allocated to productive activities, including infrastructure development, real sector expansion, and business investment. These results are also supported *Maqashid al–Shariah* Theory, which emphasizes that all economic activities in Islam should prevent harm (*mafsadah*) and promote public welfare (*maslahah*). As an Islamic financial instrument, sukuk embody the objectives of *hifz al–mal* (the protection and development of wealth), *hifz al–nafs* (the protection of life), and *hifz al–aql* (the protection of intellect) by financing productive investments that are free from *riba* (interest) and speculation (Lestari et al., 2025).

Sukuk proceeds are primarily directed toward infrastructure development, healthcare facilities, educational services, and other productive sectors. These investments enhance economic activity, improve productivity, generate employment opportunities, generate household income, expand access to public services, strengthen human capital, and improve overall quality of life. Consequently, sukuk contribute not only to higher GDP and economic growth but also to equitable, inclusive, and sustainable development in the principles of Islamic economics.

The findings are supported by previous empirical studies. Novitasari & Arundina (2023) found that sukuk have a positive and significant impact on both short–run and long–run economic growth in Indonesia, primarily because they provide financing for productive projects while promoting Islamic financial inclusion. Similarly, Kurniawan et al. (2025) and Nurcholis et al. (2024) found that sukuk positively contribute to Indonesia's economic growth by financing real sector investment and supporting infrastructure development. These findings reinforce the role of sukuk as an effective financing instrument for achieving sustainable economic growth while simultaneously advancing the objectives of Islamic finance.

The Impact of Zakat on Economic Growth

The empirical findings indicate that zakat has insignificantly impact on economic growth in the short run. However, zakat has a positive and significant impact on economic growth in the long run. These findings suggest that the economic benefits of zakat distribution require time to materialize. In Indonesia, zakat funds are allocated not only for consumptive but also for productive programs, including economic empowerment, education, and healthcare. Such programs generate long-term socioeconomic benefits rather than immediate economic outcomes. Moreover, throughout the study period, zakat collection remained substantially below its estimated national potential, limiting its contribution to short–run economic activity.

In contrast, the present result aligned with Choris et al. (2026), Khafiah et al. (2026), and Azzahra et al. (2025) who reported that zakat does not significantly influence short–run economic growth. This outcome is attributed to the relatively low level of zakat collection, suboptimal institutional management, and the fact that productive zakat programs require time to improve beneficiaries' productivity and income–generating capacity.

In the long run, zakat contributes positively and significantly to Indonesia's economic growth. This result is consistent with Endogenous Growth Theory by Romer (1990), which emphasizes that investment in human capital, innovation, and productivity constitutes a fundamental driver of sustained economic growth. Productive zakat programs directed toward education, healthcare, and economic empowerment enhance the quality of human capital, expand entrepreneurial opportunities, promote a more equitable distribution of income, and strengthen the real sector (Prastiwi et al., 2025). Collectively, these mechanisms improve productivity and support long-term economic growth.

The findings are also in support with the *Maqashid al–Shariah* Theory, articularly the objectives of *hifẓ ad–din* (the protection of religion), *hifẓ al–mal* (the protection and development of wealth) and *hifẓ al–nafs* (the protection of life) which emphasize public welfare (*maslahah*) and poverty alleviation (Lestari et al., 2025). Through its income redistribution mechanism, zakat plays a crucial role in reducing poverty, narrowing income inequality, and improving social welfare. These socioeconomic improvements ultimately create a stronger foundation for inclusive and sustainable economic growth.

The present findings are supported by previous empirical studies. Zaky & Badriyah (2024) and Siswantoro & Ikhwan (2023) found that zakat has a positive and significant long–run impact on Indonesia's economic growth by improving social welfare, increasing household consumption, enhancing productivity, and income redistribution. Similarly, Kurniawan et al. (2025), Syah et al. (2025), Ashfahany et al. (2023), Ramadhanty & Ryandono (2025), and Prawoto & Basuki (2024) found that zakat positively and significantly contributes to long-run economic growth through its role in strengthening human capital, reducing poverty, and fostering inclusive economic development.

CONCLUSION

This research aims to analyze the impact of green bonds, sukuk, and zakat on Indonesia's economic growth over the 2018–2025 period. The results finding, in the short run, only sukuk has a positive and significant impact on economic growth. In contrast, green bond and zakat do not significantly influence Indonesia's economic growth in the short run. However, in the long run, all three financial instruments, including green bond, sukuk, and zakat, have positive and significant effects on economic growth. These findings suggest that the economic benefits of green bond and zakat require time to materialize through sustainable investment, human capital development, and

economic empowerment. By contrast, sukuk generates a more immediate impact because they directly finance productive sectors and infrastructure development. Overall, this study provides additional empirical evidence that green finance and Islamic finance are strategic instruments to inclusive and sustainable economic growth in Indonesia.

Despite these contributions, this study has several limitations. First, it focuses solely on three financial indicators, such as green bond, sukuk, and zakat. Second, the analysis is limited to the 2018–2025 observation period. Future research is therefore encouraged to incorporate a broader range of sustainable and Islamic finance instruments, such as green loan, green stock, *waqf*, *infaq*, and *sadaqah*, as well as relevant macroeconomic variables. Extending the observation period and employing alternative econometric approaches may also provide more comprehensive insights. In a policy perspective, the result suggest that government and relevant stakeholders should strengthen the regulatory framework supporting the development of green bond and sukuk, encourage greater private sector participation through appropriate incentives, and enhance the monitoring of fund allocation and utilization. In addition, improving the collection and productive distribution of zakat is essential to maximize its contribution to sustainable and inclusive economic growth in Indonesia.

REFERENCE

Ajija, S. R., Sari, D. W., Setianto, R. H., & Primanti, M. R. (2011). *Cara Cerdas Menguasai EViews*. Jakarta: Salemba Empat.

Alvionita, M. (2021). Pengaruh Penerbitan Obligasi dan Sukuk terhadap Pertumbuhan Ekonomi Indonesia. *Jurnal Ilmiah Mahasiswa FEB*, *9*(2). www.imf.org/external/pubs/ft/fandd/basics/gdp.htm.

Ardiansyah, A., Meila, K. D., & Lestari, P. G. (2025). Efektivitas Penerapan Green Transition dan Kebijakan Karbon Pada Sektor Energi: Literature Review. *JRAMB: Jurnal Riset Akuntansi*, *10*(2).

Ashfahany, A. El, Hidayah, A. D. N., Hakim, L., & Noh, M. S. B. M. (2023). How Zakat Affects Economic Growth in Three Islamic Countries. *JISEL Journal of Islamic Economic Laws VI*, *6*(1), 45–61. https://journals.ums.ac.id/index.php/jisel/index

Auriga Nusantara. (2025). *Status Deforestasi Indonesia 2025*. https://simontini.id/id/status-deforestasi-di-indonesia-2025

Azzahra, A. N., Mubarok, F. K., Wahyudi, R., & Hutagalung, K. A. (2025). Pengaruh Penyaluran Zakat dan Tingkat Pengangguran Terbuka terhadap Pertumbuhan Ekonomi di Indonesia. *Green Economic Review*, *2*(1). https://journal.yaalmada.or.id/index.php/ger

Bank Indonesia. (2025a). *Ekonomi Hijau Indonesia: Jalan Menuju Masa Depan Berkelanjutan*.

Bank Indonesia. (2025b). *Perkembangan Ekonomi Indonesia dan Dunia Triwulan IV 2025*.

Batani, A. A. M., & Suparman, N. (2026). Analysis of Deforestation Control Policy in Indonesia in Supporting Sustainable Development. *Jurnalku*, *6*(2).

BAZNAS. (2025). *Laporan Pengelolaan Zakat Nasional Akhir 2025*.

BPS. (2025). *Produk Domestik Bruto Indonesia Menurut Pengeluaran 2020-2024*.

BPS. (2026a). *Profil Kemiskinan di Indonesia September 2025*.

BPS. (2026b). *Tingkat Ketimpangan Pengeluaran Penduduk Indonesia September 2025*.

Bratakusumah, D. S. (2026). Dinamika Global dan Regional serta Implikasinya bagi Ekonomi Indonesia 2026. *Bappenas Working Papers*, *9*(1), 16–30. https://doi.org/10.47266/bwp.v9i1.536

Cendekiawan, M., & Firmansyah, A. (2024). Pengembangan Green Bonds di Indonesia: Upaya Pemerintah Untuk Mewujudkan Keuangan Berkelanjutan. *Journal of Law, Administration, and Social Science*, *4*(1).

Choris, L. H. il P., Susanto, A. A., Rusgianto, S., & Widiastuti, T. (2026). Pengaruh Zakat terhadap Pertumbuhan Ekonomi di Negara-Negara OKI: Peran Moderasi Kualitas Institusi dan Tantangan Digitalisasi dalam Ekonomi Syariah. *Sanjana: Jurnal Perbankan Syariah Dan Ekonomi Syariah*, *8*(1).

Diana, D. A., Tanjung, H. B., & Nurhayati, I. C. (2026). The Influence of Zakat Funds and Sharia Financing on Indonesia's Economic Growth Through Poverty and the Human Development Index as Mediating Variables. *Tec Empresarial*, *21*(1), 535–564.

Fatmawati, L., Rosidin, A., & Al-Ra'zie, Z. H. (2025). Mengembangkan Teori Keynesian untuk Menghadapi Tantangan Ekonomi Masa Depan. *Presidensial: Jurnal Hukum, Administrasi Negara, Dan Kebijakan Publik*, *2*(2), 206–216. https://doi.org/10.62383/presidensial.v2i2.757

Gai, A. M., Arpan, Y., Poerwati, T., & Sir, M. M. (2024). *Ekonomi Pembangunan Teori dan Praktik Dalam Mengatasi Ketimpangan Ekonomi Global*. Medan: Media Penerbit Indonesia.

Ghozali, I., & Ratmono, D. (2017). *Analisis Multivariat dan Ekononometrika: Teori, Konsep, dan Aplikasi dengan EViews 10*. Semarang: Universitas Diponegoro.

Gujarati, D. N., & Porter, D. C. (2009). *Basic Economics* (5th ed.). MCGraw-Hill Irwin.

Gull, S., Farid, T., & Maqsood, Z. (2023). The Impact of Financial Development and Green Financing on Economic Growth: An ARDL Estimation. *Sustainable Trends and Business Research*, *1*(2), 101–114.

Hassan, M. K., Alshater, M. M., Hasan, R., & Bhuiyan, A. B. (2021). Islamic microfinance: A bibliometric review. *Global Finance Journal*, *49*, 100651. https://doi.org/10.1016/J.GFJ.2021.100651

Hia, F. (2025). Dinamika Pertumbuhan Ekonomi dalam Perspektif Teori Klasik dan Keynesian. *LIKUID: Jurnal Ekonomi Dan Ilmu Berkaitan*, *1*(1), 1–4.

Hidayat, A. H. R., & Laksamana, R. (2024). Pengaruh Saham Syariah, Reksadana Syariah, Dan Sukuk Terhadap Pertumbuhan Ekonomi Indonesia Periode 2019-2023. *Prosiding Program Studi Ekonomi Islam 2024*, *2*(1).

Hidayat, N., Firstiani, R., Muhlisin, Ainorrofiqie, Rahman, H., & Putri, R. O. (2025). *Buku Pengantar Ekonomi Makro*. Pekanbaru: Angkasa Media Literasi.

Hulu, H. B., Nau, N. U. W., & Seba, R. O. C. (2024). *Analisis Efektivitas Paris Agreement Terhadap Indonesia Sebagai Anggota G20 Dalam Menangani Climate Change*. *17*(2), 280–298.

ICMA. (2025). *Green Bond Principles Voluntary Process Guidelines for Issuing Green Bonds Principles*.

IDX. (2025). *Pencatatan Obligasi Berkelanjutan VII Federal International Finance Dengan Tingkat Bunga Tetap Tahap II Tahun 2025 pada tanggal 15 September 2025*. https://www.idx.co.id/id/berita/berita/20738c8b-0c95-f011-b138-0050569d3b40

IMF. (2021). *World Economic Outlook: Recovery During a Pandemic*. International Monetary Fund.

IMF. (2023). *World Economic Outlook: Navigating Global Divergences*.

IRENA. (2020). *Renewable Energy Finance: Green Bonds*. www.irena.org/publications

Jenia, A. P., & Merietza, F. (2025). Pengaruh Green Finance terhadap Pertumbuhan Ekonomi. *Al-Kharaj: Jurnal Ekonomi, Keuangan & Bisnis Syariah*, *7*(8). https://doi.org/10.47467/alkharaj.v7i8.7861

Joyonegoro, A. W., Pamungkas, P., & Wibowo, D. S. (2023). Green Bond and Economic Development: Evidence from Asian and European Countries. *Sebelas Maret Business Review*, *8*(2), 129–139. https://jurnal.uns.ac.id/smbr

Keynes, J. M. (1936). *The General Theory Of Employment Interest And Money*. Macmillan And Co.

Khafiah, L., Ghofur, R. A., & Devi, Y. (2026). Pengaruh Zakat dan Variabel Makro Ekonomi Terhadap Pertumbuhan Ekonomi di Indonesia Periode 2021 - 2024 Dengan Pendekatan ECM. *JMA: Jurnal Media Akademik*, *4*(1).

Kurniawan, E., Rani, L. N., & Pertiwi, T. D. (2025). Does Islamic Finance Drive Economic Growth in Indonesia? An Analysis Using Vector Error Correction Model. *Jurnal Ekonomi Dan Bisnis Airlangga*, *35*(1), 203–215. https://doi.org/10.20473/jeba.v35i12025.203-215

Lestari, S. F., Salam, K. S., & Asfiantika, M. D. (2025). Maqashid Al-khamsah dalam Ekonomi Islam: Perspektif Al-Ghazali, As Syatibi, dan Ibnu Khaldun. *Finotec: Journal of Islamic Finance and Economics*, *2*(3), 413–422.

Manasseh, C. O., Logan, C. S., Okanya, O. C., Ejime, O. M., Ede, K. K., Onuselogu, O. C. O., Igwemeka, E. C., Nkwonta, N. C., & Akamobi, O. G. (2026). Financial inclusion, green bonds,

and energy efficiency impact economic growth in Asia under institutional quality environment and global economic uncertainty. *Discover Sustainability*, *7*(588). https://doi.org/10.1007/s43621-026-02998-0

Mara, M. Y. I., Tjahjono, T. N., Pardede, R. S. F., Saputri, O. B., Fathoni, S., Qinthara, M. N., & Indra, C. B. G. (2025). *Ekonomi dan Keuangan Hijau: Konsep dan Implementasi di Indonesia*. Bank Indonesia Institute.

Martain, M. (2026). Tahun 2026 dan Transisi Indonesia Menuju Negara Berpendapatan Tinggi. *Bappenas Working Papers*, *9*(1), 4–15. https://doi.org/10.47266/bwp.v9i1.534

Miftahuda, K., & Galuh, A. K. (2025). The Influence of Zakat, Infaq, Sadaqah, Sukuk, and Islamic Financing on Economic Growth in Indonesia for the 2011-2024 Period. *Islamic Economics and Finance in Focus*, *4*(4), 624–637. https://doi.org/10.21776/ieff.2025.04.4.04

Nghiem, X., Bakry, W., & Mallik, G. (2026). Effects of Green Finance on Economic Growth and Renewable Energy in Developing Countries: A Panel Cointegration Analysis. *Natural Resources Forum*, 22. https://doi.org/10.1111/1477-8947.70056

Novitasari, E., & Arundina, T. (2023). Dynamic Relationship Between Sukuk And Economic Growth In Indonesia: Evidence from Vector Error Correction Model (VECM) and Wavelet Analysis. *Al-Uqud: Journal of Islamic Economics*, *7*(2).

Nurcholis, M., Hasmarini, I., Hanif, F., & Athief, N. (2024). Analisis Pengaruh Sukuk Korporasi, Total Aset Perbankan Syariah, Reksadana dan Inflasi Terhadap Pertumbuhan Ekonomi Di Indonesia Tahun 2022. *Economics and Digital Business Review*, *5*(1), 439–447.

Nurhayati, Apriyanto, Febriani, R. E., Suparyati, A., & Kusumastuti, S. Y. (2024). *BUKU REFERENSI EKONOMI PEMBANGUNAN*. Jambi: Sonpedia Publishing Indonesia. www.buku.sonpedia.com

OJK. (2016). *Laporan Kajian: Pengembangan Green Bond di Indonesia*.

OJK. (2025). *Siaran Pers Bersama: Indeks Literasi dan Inklusi Keuangan Masyarakat Meningkat, OJK dan BPS Umumkan Hasil Survei Nasional Literasi Dan Inklusi Keuangan (SNLIK) Tahun 2025*. https://ojk.go.id/id/berita-dan-kegiatan/siaran-pers/Pages/OJK-dan-BPS-Umumkan-Hasil-Survei-Nasional-Literasi-Dan-Inklusi-Keuangan-SNLIK-Tahun-2025.aspx

Prasetyo, A. D., Soemitra, A., & Anggraini, T. (2025). Analisis Pengaruh Nilai Tukar Rupiah, BI-Rate, dan Suku Bunga The Fed terhadap Indeks Harga Saham Gabungan (IHSG) di Bursa Efek Indonesia Periode 2020–2024. *Paradoks: Jurnal Ilmu Ekonomi*, *8*(3), 360–370. https://doi.org/10.57178/paradoks.v8i3.1371

Prastiwi, I. W., Amalia, D., & Khairani, S. (2025). Teori-Teori Pertumbuhan dan Pembangunan Ekonomi. *Maslahah: Jurnal Manajemen Dan Ekonomi Syariah*, *3*(1), 297–305. https://doi.org/10.59059/maslahah.v3i1.2079

Prawoto, N., & Basuki, A. T. (2024). The Influence of Zakat and Macro Variables on Economic Growth. *Corporate Law and Governance Review*, *6*(2), 54–63. https://doi.org/10.22495/clgrv6i2p5

Prisandy, R. F., & Widyaningrum, W. (2022). Green Bond in Indonesia: The Challenges and Opportunities. In *Indonesia Post-Pandemic Outlook: Rethinking Health and Economics Post-COVID-19*. Penerbit BRIN. https://doi.org/10.55981/brin.537.c529

Ramadhanty, R. P., & Ryandono, M. N. H. (2025). Analysis of Economic Conjuncture on The Collection and Distribution of Zakat, Infaq, and Sadaqah (ZIS) and Provincial Economic Growth in Indonesia. *Jurnal Ekonomi Dan Bisnis Airlangga*, *35*(1), 83–104. https://doi.org/10.20473/jeba.v35i12025.83-104

Romer, P. M. (1990). *Endogenous Technological Change*.

Rusmini, Cahyono, D. N., Putri, K., Afkarina, I., Aprilia, P., Taufiq, A., Lestari, D. P., Silvia, K. J., Misrul, & Firmanda, B. A. (2023). Bangkitnya Perekonomian Indonesia Pasca Covid-19. *Ekonomi Bisnis Dan Kewirausahaan*, *12*(1).

Safitri, E., Yuliana, I., Firmansyah, F., & Adabiyah, R. C. (2025). Pengaruh Sukuk dan Reksadana Syariah Terhadap Pertumbuhan Ekonomi Melalui Inklusi Keuangan Syariah Sebagai Variabel Intervening. *Jurnal Rumpun Ekonomi Syariah*, *8*(1).

Safitri, I., Muchlis, M., Parakkasi, I., & Kamaruddin, K. (2024). Pengaruh Reksa Dana Syariah, Saham Syariah Dan Sukuk Terhadap Pertumbuhan Ekonomi Di Indonesia Dengan Inflasi Sebagai Variabel Moderasi. *Al-Buhuts*, *20*(2), 19–36.

Sharma, R., Das, P., Singh, M., Anjali, Jegadheesan, C., & Rakesh, K. R. (2025). Impact of Green Finance Initiatives on Sustainable Economic Growth: A Comparative Study of Developed and Emerging Economies. *European Economic Letters*, *15*(2). http://eelet.org.ukhttp://eelet.org.uk

Siahaan, O., Herlina, D., & Suci, S. C. (2025). The impact of renewable energy, green economy, and blue economy on economic growth. *Journal of Business and Information Systems (e-ISSN: 2685-2543)*, *7*(1), 66–78. https://doi.org/10.31316/jbis.v7i1.284

Siswantoro, & Ikhwan, I. (2023). The Contribution of Islamic Social Finance to Economic Growth in Indonesia. *RISFE: Review of Islamic Social Finance and Entrepreneurship*, *2*(1), 1–12. https://doi.org/10.20885/RISFE.vol2.iss

SMI. (2023). *Laporan Obligasi Berwawasan Lingkungan: Green Bond Report*.

Sugiono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. CV. Alfabeta.

Suparman. (2023). *Ekonomi Hijau: Diskursus dan Transisi Menuju Ekonomi Hijau 5.0*. Tasikmalaya: Edu Publisher.

Syah, S., Soemitra, A., & Harahap, I. (2025). Examining The Impact of Investment, Labor, and Zakat on Economic Growth in Indonesia: A Panel Data Approach. *Jurnal Managemen Dakwah*, *6*(2).

Ulfa, M., & Roosmalitasari, N. (2022). Pengaruh Sukuk, Reksadana dan Saham Syariah dan Sukuk terhadap Laju Pertumbuhan Ekonomi di Indonesia Tahun 2017-2020. *JEMBA: Jurnal Ekonomi, Manajemen, Bisnis Dan Akuntansi*, *1*(4).

World Bank. (2021). *Sustainable Development Bonds & Green Bonds: Impact Report 2020*.

World Population Review. (2026). *Indonesia Population*. https://worldpopulationreview.com/countries/indonesia

World Risk Report. (2025). *World Risk Report 2025 - Focus: Floods*.

Zaky, M., & Badriyah, N. (2024). Analisis Pengaruh Penyaluran ZIS Terhadap Pertumbuhan Ekonomi Indonesia Tahun 2016-2021. *Islamic Economics and Finance in Focus*, *3*(2), 324–335. https://doi.org/10.21776/ieff

Zaza, A. M. S. U., Banoet, R. Y., & Dima, E. T. Y. (2025). Dampak Ketengangan Geopolitik terhadap Investasi Asing Langsung (FDI) di Indonesia. *Scientific Journal of Reflection: Economic, Accounting, Management and Business*, *8*(3), 949–958.

Zhou, J., & Guo, Y. (2026). The impact of green finance on economic growth and environmental quality. *Finance Research Letters*, *87*, 109087. https://doi.org/https://doi.org/10.1016/j.frl.2025.109087