

POVERTY, UNEMPLOYMENT, HUMAN DEVELOPMENT, AND REGIONAL ECONOMIC GROWTH IN SOUTH SULAWESI: PANEL EVIDENCE FROM AN ISLAMIC ECONOMICS PERSPECTIVE

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ABSTRACT

Regional economic growth does not always lead to poverty reduction, labor absorption, or equitable welfare improvement. This study examines the relationship between poverty, the open unemployment rate, the Human Development Index (HDI), and regional economic growth across twenty-four regencies/municipalities in South Sulawesi during 2021–2025. Using balanced panel data, the study applies panel regression analysis, with the Common Effect Model selected through model specification tests. Because diagnostic tests indicate heteroskedasticity and first-order autocorrelation, the final estimation employs White period standard errors with cross-section clustering. The results show that poverty has a negative but statistically insignificant relationship with regional economic growth, while the open unemployment rate and HDI are also statistically insignificant. These findings suggest that short-term regional growth in South Sulawesi is not sufficiently explained by poverty, unemployment, and human development indicators alone, but may be influenced by broader structural factors, including sectoral composition, investment, public expenditure, infrastructure, and local recovery capacity. From an Islamic economics perspective, this study highlights the need to orient regional development beyond output expansion toward distributive justice, poverty reduction, productive employment, and welfare-based growth.

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INTRODUCTION

Economic growth remains a key indicator of regional development because it reflects changes in real regional output, productive capacity, and overall economic activity. In empirical regional studies, economic growth is commonly proxied by Gross Regional Domestic Product (GRDP) at constant prices because it captures real output changes after removing price effects (Fitriady et al., 2022; Ratnasari et al., 2023). However, growth should not be treated as the sole measure of development success. Higher GRDP growth does not automatically reduce poverty, generate employment, or improve welfare when its benefits are concentrated in particular sectors, groups, or territories.

The concept of inclusive growth emphasizes that growth becomes meaningful only when it reduces poverty, inequality, unemployment, and social vulnerability (Hidayat et al., 2020). Empirical studies also show that poverty is shaped not only by economic growth, but also by education, unemployment, human development, and broader welfare conditions (Ningrum et al., 2020). Therefore, regional development should be assessed not merely through output expansion, but also through its ability to reduce poverty, improve labor-market outcomes, and strengthen human development (Marrero & Servén, 2022; Zizzamia, 2020).

South Sulawesi provides an appropriate empirical setting for examining this issue because its 24 regencies/municipalities have diverse economic structures and development capacities. Makassar, as the provincial economic center, differs from agricultural regions such as Bone, resource-based areas such as Luwu Timur, industrially growing areas such as Bantaeng, and service-oriented

municipalities such as Palopo and Parepare. This heterogeneity makes provincial-level analysis insufficient for capturing local development dynamics. Panel data for 2021–2025 show substantial regional variation: economic growth ranges from -1.39% to 15.45%, poverty from 4.43% to 14.28%, open unemployment from 0.58% to 13.18%, and the Human Development Index (HDI) from 67.54 to 85.66. These variations indicate that growth, poverty, unemployment, and human development are unevenly distributed across regencies/municipalities. They also justify the use of regency/municipality-level panel data to capture local heterogeneity and post-pandemic recovery dynamics more accurately (BPS Provinsi Sulawesi Selatan, 2025).

The empirical problem is that regional economic growth does not always move in line with poverty reduction and employment creation. Output expansion may occur without sufficient improvement in employment quality, while informal work, unemployment, and unequal income distribution continue to weaken the inclusiveness of growth (Azakiyyah et al., 2025; Malik et al., 2021; Nurias et al., 2023). Moreover, the open unemployment rate may not fully reflect labor-market vulnerability because many workers are absorbed into informal, underemployed, or low-productivity jobs. In this context, HDI is included as a control variable because education, health, and living standards strengthen human capital, productivity, and the capacity of regions to translate economic growth into poverty reduction and welfare improvement (Agussalim et al., 2024; Masduki et al., 2022). Thus, the relationship between poverty, unemployment, and economic growth needs to be examined while controlling for differences in human development quality.

Previous studies have examined the relationship between poverty, unemployment, HDI, and regional economic growth, yet the findings remain context-dependent. Economic growth and GRDP expansion do not automatically reduce poverty when growth is concentrated in certain sectors, groups, or territories and is not supported by equal access to education, health services, decent employment, infrastructure, and productive resources (M. Ali et al., 2024; Hidayat et al., 2020; Komariyah et al., 2023).

In Indonesia, Alwi et al. (2021), Utami and Masjkuri (2020), and Machmud and Sidharta (2023) show that economic growth, education, unemployment, poverty, and human development jointly shape regional welfare outcomes. However, employment status does not necessarily capture job quality, particularly when workers face underemployment or move into less secure and lower-productivity jobs (Dartanto et al., 2023).

These studies suggest that poverty, unemployment, HDI, and economic growth should therefore be examined not as isolated indicators, but as interconnected dimensions of structural development, labor-market quality, and human welfare in regional development analysis. From an Islamic economics perspective, economic development should not be assessed only through output growth, but also through distributive justice, poverty alleviation, human development, and community empowerment. Several studies emphasize that poverty, zakat, Islamic philanthropy, and human development are relevant in strengthening welfare and social justice (Mutmainah et al., 2024; Novreska & Arundina, 2024; Rusanti et al., 2023). Other studies also show that poverty, unemployment, HDI, and economic growth can be interpreted within the framework of Islamic welfare and

justice (Viollani et al., 2022; Aydin, 2017; Pratomo et al., 2024; Sari et al., 2024). Nevertheless, most previous studies remain concentrated at the national, provincial, cross-country, or conceptual-normative level.

As a result, empirical evidence at the regency/municipality level remains limited, particularly in studies that combine regional panel analysis with an Islamic economics interpretation. This gap is important because aggregate provincial analysis may conceal local differences in poverty, labor-market conditions, human development, and economic performance. Local governments need evidence that reflects actual regional conditions, especially when designing policies that do not merely pursue output growth, but also address poverty, employment vulnerability, and human development disparities. Therefore, a regency/municipality-level panel study is needed to provide more contextual evidence for local development policy in South Sulawesi.

The novelty of this study lies in its regency/municipality-level panel evidence on the relationship between poverty, open unemployment, human development, and regional economic growth in South Sulawesi during the post-pandemic recovery period. Unlike previous studies that mostly examine these relationships at the national, provincial, or normative-conceptual level, this study provides a more disaggregated regional analysis and interprets the findings through Islamic economics principles of *al-'adl* (justice), *maṣlaḥah* (public benefit), *falāḥ* (holistic well-being), equitable distribution, and productive empowerment. Thus, the contribution of this study is not only empirical but also interpretative, by linking regional growth performance with welfare-oriented and justice-based development.

LITERATURE REVIEW

Regional Economic Growth and Inclusive Development

Regional economic growth reflects the capacity of a region to expand real output and sustain productive activity over time. In regional studies, Gross Regional Domestic Product (GRDP) at constant prices is commonly used because it captures real changes in economic activity after removing price effects. However, GRDP growth alone does not fully explain the quality of development. A region may grow economically while poverty, unemployment, inequality, and unequal access to education, health services, infrastructure, and decent work remain unresolved. For this reason, regional development should be understood not only as an increase in output, but also as a process that improves welfare and broadens economic opportunities.

This perspective challenges growth-centred development models that assume output expansion will automatically improve welfare. In reality, growth may be captured by specific sectors, territories, or income groups, weakening its effects on poverty reduction and job creation. Marrero and Servén (2022) show that the growth-poverty link is more stable than the growth-inequality link, indicating that distributional conditions shape whether growth becomes welfare-enhancing.

Similarly, Zizzamia (2020) demonstrates that employment does not necessarily reduce poverty when work is informal, insecure, or poorly paid. Regional growth therefore cannot be evaluated by output indicators alone. It must be assessed through employment quality, income distribution, and access to productive resources that determine whether growth becomes genuinely inclusive and socially transformative at the local level in practice.

Inclusive growth offers a more relevant framework for evaluating regional development because it links economic expansion with poverty reduction, employment opportunities, human capital improvement, and fairer distribution of development benefits (Ali & Son, 2007; Khan et al., 2016; Mushtaq & Zaman, 2021). Empirical evidence supports this argument. Purwanti (2024) finds that inclusive growth in East Java has not fully reduced unemployment and inequality, while Harnani (2023) and Suci et al. (2023) show that economic growth does not necessarily reduce poverty when human development and distributional quality remain weak. Regional inequality may also weaken growth and deepen poverty when job creation and wage distribution are uneven (Az zakiyyah et al., 2025; Naufal & Fikriah, 2023).

Human development and public policy are therefore central to making growth more inclusive. Improvements in education, health, and living standards strengthen productivity and help regions translate growth into poverty reduction and welfare improvement (Machmud & Sidharta, 2023; Rizky et al., 2024). At the same time, fiscal policy, public expenditure, infrastructure, and access to basic services are needed to ensure that development benefits reach broader groups of society (Ernawati et al., 2021; Setyowati et al., 2021). Accordingly, this study treats regional economic growth not merely as GRDP expansion, but as a development outcome that must be examined alongside poverty, unemployment, and human development.

Poverty and Regional Economic Growth

Poverty is a structural constraint on regional economic growth because it limits people's ability to participate productively in economic activity. Poor households generally

have low purchasing power, limited access to education and health services, and restricted access to capital, technology, and productive resources. These limitations weaken household consumption, reduce labor productivity, and constrain the accumulation of human capital. At the regional level, widespread poverty may reduce aggregate demand, discourage business expansion, and limit the capacity of local economies to grow sustainably. Marrero and Servén (2022) argue that poverty and inequality can weaken the quality of growth when economic opportunities are unevenly distributed, while Machmud and Sidharta (2023) show that human development plays a significant role in linking regional development and poverty reduction.

The poverty-growth relationship is expected to be negative, but its strength depends on regional structure and the inclusiveness of growth. Economic growth can reduce poverty when it creates productive employment, increases household income, and improves access to education, health, and economic opportunities. However, growth may fail to reduce poverty when it is concentrated in capital-intensive sectors or when its benefits are captured by limited groups. In this context, poverty may persist even in growing regions if the poor remain excluded from productive sectors.

Studies in Indonesia show that poverty can weaken economic growth by reducing consumption capacity and human capital quality (Sulaeman et al., 2024), while education and health are important channels through which poverty reduction supports regional growth (De Silva & Sumarto, 2015). Other studies also indicate that limited education, weak access to productive resources, and regional disparities can deepen poverty and

constrain local development, particularly in less-developed regions (Didu et al., 2023).

Empirical evidence further suggests that poverty reduction depends not only on the rate of growth, but also on its distributional quality. Maryam et al. (2024) show that economic growth in West Java has not been fully pro-poor because poverty reduction has progressed more slowly than output expansion. Naufal and Fikriah (2023) also highlight the reciprocal relationship between poverty and regional growth: extreme poverty can restrict growth, while non-inclusive growth may fail to reduce poverty effectively. The effect of poverty on growth may also vary across regions depending on economic structure, income distribution, labor-market conditions, infrastructure, and local policy capacity. Regions with stronger human capital, better infrastructure, and more inclusive employment opportunities are more likely to transform growth into poverty reduction. Conversely, regions with extreme poverty, weak labor productivity, and limited access to productive resources may remain trapped in low-growth dynamics. Therefore, poverty is expected to have a negative relationship with regional economic growth.

H1: Poverty has a negative relationship with regional economic growth.

Unemployment and Regional Economic Growth

Unemployment matters for regional growth because it shows how effectively a local economy absorbs its labor force into productive activity. When unemployment is high, part of the working-age population does not contribute directly to output creation. This weakens household income, reduces purchasing power, and limits aggregate demand, which in turn may constrain

production, investment, and business expansion. In this sense, unemployment is not merely a labor-market indicator, but also a signal of unused economic capacity that can slow regional growth (Rajlakshmi Datta, 2025). Empirical studies also suggest that unemployment may weaken the contribution of regional competitiveness to growth and reduce the efficiency of labor utilization when local economies fail to create sufficient productive employment (Harsono et al., 2025; Mubarak & SBM, 2020).

Nevertheless, the relationship between unemployment and growth is not always direct, particularly in developing economies where informal employment is widespread. The open unemployment rate may underestimate labor-market vulnerability because many people are statistically classified as employed even when they work in unstable, low-paid, part-time, or low-productivity jobs. During economic shocks, workers may shift into informal or underemployed positions rather than become openly unemployed (Daud et al., 2024). This helps explain why open unemployment sometimes shows a weak or insignificant relationship with growth or poverty, especially in regions where the informal sector functions as a buffer for workers with limited alternatives (Ssenyonga, 2021).

From an inclusive development perspective, reducing unemployment remains essential because productive employment connects growth with household income, poverty reduction, and welfare improvement. Regions that create decent and productive jobs are more likely to generate stronger consumption, wider economic participation, and more sustainable growth. Therefore, although the open unemployment rate does not fully capture job quality, unemployment is still

theoretically expected to have a negative relationship with regional economic growth.

H2: Unemployment has a negative relationship with regional economic growth.

Human Development Index as a Control Variable

The Human Development Index (HDI) is used as a control variable because regional growth is closely shaped by the quality of human development. HDI captures education, health, and decent living standards, all of which influence labor productivity, purchasing power, adaptive capacity, and long-term economic performance. From a human capital perspective, investment in education and health strengthens individual capabilities and improves productivity, making human development an important condition for sustainable regional growth (Becker, 2009; Schultz, 1961).

Controlling HDI is important because poverty and unemployment do not affect growth in isolation. Regions with better education and health outcomes are more capable of transforming economic activity into welfare improvement. By contrast, regions with weaker human development may face lower productivity, limited income opportunities, and weaker economic resilience. Without accounting for HDI, the estimated relationship between poverty, unemployment, and growth may be distorted because part of the variation in regional growth may reflect differences in human development quality.

Empirical studies support this position. Rizky et al. (2024) show that HDI contributes to reducing socio-economic inequality, while Yusnuri and Abubakar (2023) find that HDI, unemployment, and poverty jointly influence economic growth in Indonesia. Verawaty et al. (2021) also highlights the role of education and

health in strengthening human development and regional welfare. Therefore, this study does not position HDI as the main explanatory variable or as a moderator. Instead, HDI is

included as a control variable to provide a more balanced estimation of the relationship between poverty, unemployment, and regional economic growth.

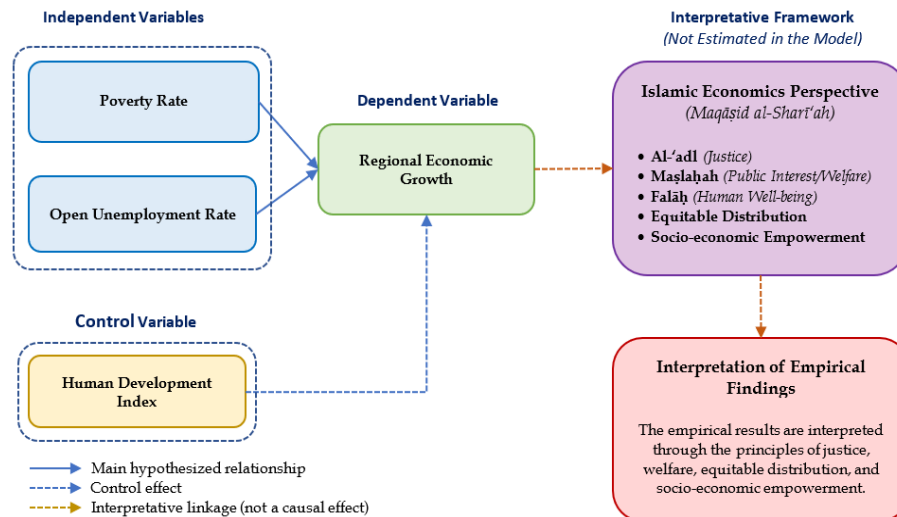


Figure 1. Conceptual Framework

Islamic Economics Perspective on Growth, Poverty, and Welfare

From an Islamic economics perspective, economic growth is not sufficient when it is understood only as output expansion or an increase in GRDP. Growth should be assessed by its ability to promote distributive justice, reduce poverty, create productive opportunities, and improve human welfare. This view is rooted in the principles of *al-'adl*, *maṣlaḥah*, and *falāḥ*, which place justice, public benefit, and holistic well-being at the center of development. Therefore, growth that coexists with persistent poverty, unemployment, and unequal access to productive resources remains incomplete from an Islamic economic viewpoint (Viollani et al., 2022; Aydin, 2017).

Poverty and unemployment are not merely statistical indicators; they reflect limited access to productive resources, weak economic participation, and insufficient socio-economic empowerment. Islamic social finance instruments such as zakat, waqf, qard ḥasan,

and Islamic microfinance are relevant because they can support redistribution, social protection, and productive empowerment for poor and vulnerable groups. Empirical studies indicate that Islamic social finance can support poverty alleviation, income redistribution, and microenterprise empowerment when directed toward productive activities (Ascarya, 2022; Ayuniyyah et al., 2022; Ozdemir et al., 2023). In addition, Islamic microfinance and sharia-based financing may reduce financial exclusion and improve household welfare among low-income groups (Ozdemir et al., 2023; Razak & Asutay, 2022).

In this study, Islamic economics serves as an interpretative perspective, not a directly estimated variable in the regression model. The relationship among poverty, unemployment, HDI, and regional economic growth is therefore read beyond statistical significance by assessing whether growth advances justice, welfare, equitable distribution, and empowerment. This perspective is crucial because output growth

that leaves poverty and employment vulnerability unresolved cannot be regarded as genuinely inclusive or welfare-oriented within an Islamic economic framework in regional development practice.

RESEARCH METHOD

This study employs a quantitative research design using panel data regression to examine the relationships among poverty, the open unemployment rate, the Human Development Index (HDI), and regional economic growth across regencies/municipalities in South Sulawesi. Panel data are appropriate because they combine cross-sectional variation across regions with time-series variation across years, allowing the model to capture regional heterogeneity and temporal dynamics (Baltagi, 2021; Wooldridge, 2020).

The unit of analysis comprises all 24 regencies/municipalities in South Sulawesi observed over the 2021–2025 period, producing a balanced panel dataset of 120 region-year observations. Since the study covers the entire population of regencies/municipalities in the

province, it applies a census of regional units rather than a sampling procedure. This design allows the analysis to capture cross-regional variation more comprehensively and reduces the risk of selection bias in representing South Sulawesi's local development conditions.

The dependent variable is regional economic growth, measured by the annual growth rate of Gross Regional Domestic Product (GRDP) at constant prices. This measure is used because it reflects real changes in regional output after excluding price fluctuations. The data were obtained from BPS-Statistics Indonesia, South Sulawesi Province.

The independent variables are poverty and open unemployment. Poverty is measured by the percentage of the population living below the poverty line, while unemployment is measured by the open unemployment rate. HDI is included as a control variable because it captures education, health, and living standards, which are closely associated with human capital formation, labor productivity, and regional economic capacity (Becker, 2009; Schultz, 1961).

Table 1. Operational Definition of Variables

Variable	Measurement	Data Source
Regional Economic Growth	Annual growth rate of GRDP at constant prices (%)	BPS Sulawesi Selatan
Poverty	Percentage of poor population (%)	BPS Sulawesi Selatan
Open Unemployment Rate	Open unemployment rate (%)	BPS Sulawesi Selatan
Human Development Index	HDI score	BPS Sulawesi Selatan

The empirical model is specified as follows:

$$Growth_{it} = \alpha + \beta_1 Unemployment_{it} + \beta_2 Poverty_{it} + \beta_3 HDI_{it} + \varepsilon_{it}$$

Where $Growth_{it}$ represents economic growth in regency/municipality i during year t , $Poverty_{it}$ represents the poverty rate, $Unemployment_{it}$ represents the open unemployment rate, HDI_{it} represents the Human Development Index, α is the constant,

β_1 , β_2 , and β_3 are regression coefficients, and ε_{it} is the error term.

Data analysis was conducted using panel regression. Three estimation approaches were considered: the Common Effect Model, Fixed Effect Model, and Random Effect Model. The

Common Effect Model assumes a homogeneous intercept across all cross-sectional units. The Fixed Effect Model controls for unobserved region-specific characteristics, while the Random Effect Model treats regional heterogeneity as random components that are uncorrelated with the explanatory variables (Baltagi, 2021; Gujarati & Porter, 2010). Model selection was conducted using the Chow test, Hausman test, and Lagrange Multiplier test. The Chow test compares the Common Effect Model and Fixed Effect Model, the Hausman test compares the Fixed Effect Model and Random Effect Model, and the Lagrange Multiplier test compares the Common Effect Model and Random Effect Model (Breusch & Pagan, 1980; Hausman, 1978).

Before interpreting the regression results, diagnostic tests were conducted to examine multicollinearity, heteroskedasticity, and autocorrelation. Multicollinearity was assessed using the correlation matrix and Variance Inflation Factor (VIF), with VIF values below the commonly used threshold indicating no serious multicollinearity problem (Gujarati & Porter, 2010). Heteroskedasticity was examined using the Panel Cross-section and Period Heteroskedasticity LR tests, while autocorrelation was tested using the Wooldridge test for autocorrelation in panel data. Because the diagnostic tests indicate cross-sectional heteroskedasticity and within-panel serial correlation, the final estimation applies White period standard errors with cross-section clustering to obtain more reliable standard errors, t-statistics, and p-values (White, 1980; Wooldridge, 2020).

The empirical findings are then interpreted from an Islamic economics perspective, particularly through the principles of justice, welfare, equitable distribution, and socio-economic empowerment. In this study,

Islamic economics is used as an interpretative framework rather than as a directly estimated variable in the econometric model.

RESULTS AND DISCUSSION

Results

Descriptive Statistics

As shown in Table 2, this study uses a balanced panel dataset covering 24 regencies/municipalities in South Sulawesi from 2021 to 2025, yielding 120 observations. The descriptive statistics indicate substantial regional heterogeneity, showing that economic growth, poverty, unemployment, and human development are unevenly distributed across local economies. Economic growth averages 4.88%, but its wide range, from -1.39% to 15.45%, suggests that post-pandemic recovery varied considerably across regions. Some regencies/municipalities still experienced economic contraction, while others achieved relatively high growth. This dispersion implies that regional economic performance in South Sulawesi is not shaped only by provincial-level recovery trends, but also by differences in local economic structures, sectoral resilience, investment capacity, and productive bases.

The poverty rate averages 8.97%, ranging from 4.43% to 14.28%, indicating uneven welfare outcomes across regions within the same province. The open unemployment rate also varies substantially, from 0.58% to 13.18%, with an average of 3.93%, reflecting heterogeneous labor-market conditions. However, this indicator should be interpreted cautiously, since low open unemployment does not necessarily imply high-quality employment, particularly in regions where informal work, underemployment, seasonal employment, and low-productivity jobs remain prevalent. Meanwhile, HDI ranges from 67.54

to 85.66, with an average of 73.85, indicating differences in education, health, and living standards that may affect productivity, labor quality, purchasing power, and the capacity of local economies to transform growth into welfare improvement. Overall, the variation reported in Table 2 strengthens the justification for panel data analysis and supports the central argument that regional economic growth in South Sulawesi should be examined alongside poverty, labor-market conditions, and human development quality.

Panel Model Selection

Before the final estimation, this study conducted the Chow test, Hausman test, and Lagrange Multiplier test to determine the most

appropriate panel regression model. As shown in Table 3, the Chow test indicates that the Fixed Effect Model is not preferred because the probability values of both the Cross-section F and Cross-section Chi-square tests exceed 0.05.

The Hausman test suggests that the Random Effect Model is preferable to the Fixed Effect Model. However, the Lagrange Multiplier test shows that the Common Effect Model is more appropriate than the Random Effect Model, as the probability values for cross-section, time, and combined effects are all above 0.05. Therefore, the Common Effect Model is selected for the final regression estimation, indicating that unobserved regional and time-specific effects are not statistically dominant in the model.

Table 2. Descriptive Statistics

Variable	Obs.	Mean	Minimum	Maximum	Std. Dev.
Economic Growth (%)	120	4.88	-1.39	15.45	1.77
Poverty Rate (%)	120	8.97	4.43	14.28	2.64
Open Unemployment Rate (%)	120	3.93	0.58	13.18	2.16
Human Development Index	120	73.85	67.54	85.66	3.68

Source: Author's calculation based on BPS Sulawesi Selatan data, 2021–2025.

Table 3. Panel Model Selection Test Results

Test	Model Comparison	Statistic	Prob.	Selected Model
Chow Test	Common Effect vs Fixed Effect	0.963955	0.5175	Common Effect
Hausman Test	Fixed Effect vs Random Effect	3.322987	0.3445	Random Effect
Lagrange Multiplier Test	Common Effect vs Random Effect	0.780673	0.3769	Common Effect

Source: Author's calculation using EViews.

Diagnostic Test Results

The diagnostic tests show that the model is not affected by serious multicollinearity. As reported in Table 4, the VIF values for the open unemployment rate, poverty, and HDI are 2.218, 1.500, and 2.732, respectively, all below the commonly accepted threshold of 10. This indicates that the explanatory variables are sufficiently independent to be estimated within the same regression model without generating substantial multicollinearity bias.

However, the residual diagnostics reveal heteroskedasticity and serial correlation. The heteroskedasticity LR test indicates unequal error variance across regions ($p < 0.001$), while the Wooldridge test rejects the null hypothesis of no first-order autocorrelation ($p < 0.001$). These results confirm that the model's error structure violates the classical assumptions. Therefore, the final estimation applies White period standard errors with cross-section

clustering to produce more reliable standard errors, t-statistics, and p-values.

Panel Regression Results

As shown in Table 5, Model 2 serves as the main specification because it controls for HDI and uses White period standard errors with cross-section clustering to correct heteroskedasticity and within-panel serial correlation. The poverty coefficient is negative but not statistically significant. Although its direction supports theoretical expectations, the evidence is insufficient to establish a robust poverty-growth relationship in South Sulawesi during 2021–2025, indicating that short-term regional growth may be driven by factors beyond poverty alone in this observed period.

The open unemployment rate is also not statistically significant, suggesting that this

indicator may not fully capture labor-market vulnerability in regions where informal work, underemployment, and low-productivity jobs remain prevalent. HDI is likewise not statistically significant, implying that differences in human development quality may not be immediately reflected in short-term annual growth variation.

Overall, the low R-squared and insignificant F-statistic indicate that regional growth in South Sulawesi is weakly explained by poverty, unemployment, and HDI alone. Its variation likely reflects broader structural forces, including sectoral composition, investment, public spending, infrastructure, commodity dynamics, fiscal capacity, and uneven local recovery.

Table 4. Diagnostic Test Results

Diagnostic Test	Statistic / Indicator	Value	Prob.	Decision
Multicollinearity	VIF: Open Unemployment Rate	2.218	—	No serious multicollinearity
Multicollinearity	VIF: Poverty	1.500	—	No serious multicollinearity
Multicollinearity	VIF: Human Development Index	2.732	—	No serious multicollinearity
Cross-section heteroskedasticity	LR statistic	117.6678	0.0000	Heteroskedasticity detected
Period heteroskedasticity	LR statistic	33.9220	0.0861	No period heteroskedasticity at 5% level
Autocorrelation	Wooldridge test	F = 24.901	0.0000	Autocorrelation detected

Source: Author's calculation using EViews and Stata

Table 5. Panel Regression Results

Variable	Model 1 Coefficient	Prob.	Model 2 Coefficient	Prob.
Constant	4.939128	0.0000	12.896240	0.0397
Open Unemployment Rate	0.026159	0.7546	0.137440	0.1234
Poverty	-0.018253	0.7899	-0.066646	0.2953
Human Development Index	—	—	-0.107789	0.1780
R-squared	0.002494	—	0.020924	—
Adjusted R-squared	-0.014558	—	-0.004397	—
Prob. F-statistic	0.864103	—	0.481939	—

Note: Model 2 is estimated using White period standard errors with cross-section clustering to address heteroskedasticity and within-panel serial correlation.

Source: Author's calculation using EViews

Discussion

Consistent with the conceptual framework, poverty and the open unemployment rate are treated as the main explanatory variables, HDI is included as a control variable, and Islamic economics is used as an interpretative lens rather than as an estimated variable in the regression model.

As shown in Table 5, poverty has a negative but not statistically significant relationship with regional economic growth after applying White period standard errors with cross-section clustering. The negative coefficient is theoretically relevant because poverty may constrain growth through weak purchasing power, limited access to education and health services, lower labor productivity, and restricted participation in productive economic activities. However, the absence of statistical significance indicates that poverty alone does not strongly explain short-term regional growth variation in South Sulawesi during 2021–2025. This finding supports the view that the poverty–growth relationship is context-dependent and shaped by the inclusiveness of growth, employment creation, and regional productive structures (Harsono et al., 2025; Machmud & Sidharta, 2023; Marrero & Servén, 2022).

This result suggests that post-pandemic regional growth may have been driven more by sector-specific recovery, public spending, investment, commodity dynamics, or resource-based activities than by broad-based improvements in household welfare. Growth may occur without immediately reducing poverty when output expansion is concentrated in sectors with weak linkages to low-income households. Therefore, the insignificant poverty coefficient should not be read as evidence that poverty is irrelevant.

Rather, it indicates that poverty reduction requires growth that is more labor-absorbing, spatially inclusive, and connected to the productive capacity of poor and vulnerable groups (Hidayat et al., 2020; Masduki et al., 2022; Nurlina et al., 2021).

The open unemployment rate is also not statistically significant. This finding may reflect the limitation of open unemployment as an indicator of labor-market quality. In regional economies where informal employment, seasonal work, underemployment, and low-productivity jobs remain prevalent, many workers may be classified as employed even when their jobs do not provide stable income or meaningful productivity gains. This helps explain why open unemployment may have a weak relationship with annual economic growth. Thus, the key labor-market issue is not only the number of unemployed workers, but also the quality, stability, productivity, and income-generating capacity of employment (Leasiwal et al., 2022; Nurrahman, 2024; Zizzamia, 2020).

HDI, as a control variable, is likewise not statistically significant. This does not imply that human development is irrelevant to regional growth. Instead, it suggests that improvements in education, health, and living standards may require a longer time horizon before they are reflected in annual growth performance. Human development affects growth through gradual mechanisms, including productivity improvement, skill formation, adaptive capacity, and household welfare. Given the relatively short 2021–2025 panel period, the model may not fully capture the long-term economic returns of human development (Ilham et al., 2023; Rizky et al., 2024).

The model's low explanatory power should therefore be interpreted carefully. It does not necessarily indicate that the model is

irrelevant. Rather, it suggests that short-term regional economic growth is influenced by broader structural factors beyond poverty, open unemployment, and HDI. Regional growth may also be shaped by sectoral composition, investment realization, government expenditure, infrastructure quality, fiscal capacity, commodity price movements, tourism recovery, industrial concentration, and spatial spillover effects. Since this study focuses on poverty, unemployment, and human development indicators, the low R-squared value suggests that future research should incorporate broader structural variables and consider spatial or dynamic panel models to capture more complex regional growth mechanisms.

From an Islamic economics perspective, these findings reinforce the need to evaluate regional development beyond output expansion. Growth that is not clearly linked to poverty reduction, employment quality, human development, and equitable access to productive resources remains incomplete from the standpoint of *al-'adl*, *maṣlaḥah*, and *falāḥ*. Although Islamic social finance is not directly estimated in the model, instruments such as zakat, waqf, and Islamic microfinance may complement regional development strategies by supporting productive empowerment, financial inclusion, and poverty alleviation (Viollani et al., 2022; Arwani & Wahdati, 2020; Pratomo et al., 2024; Sari et al., 2024).

The policy implication is that local governments in South Sulawesi should shift from a narrow focus on economic growth acceleration toward improving the quality of growth. Regional development policy should prioritize labor-absorbing sectors, employment quality, access to education and health services, and the productive capacity of poor and vulnerable households. Development planning

should integrate poverty reduction, decent job creation, and human development into regional growth strategies. In this regard, zakat, waqf, Islamic microfinance, and other Islamic social finance instruments can complement public policy by supporting productive empowerment, financial inclusion, and targeted poverty alleviation. Welfare-oriented regional development therefore requires stronger coordination among local governments, Islamic social finance institutions, and community-based economic empowerment programs.

CONCLUSION

This study examined the relationships among poverty, the open unemployment rate, HDI, and regional economic growth across 24 regencies/municipalities in South Sulawesi during 2021–2025 using panel data analysis. The results show that poverty has a negative but not statistically significant relationship with regional economic growth after applying White period standard errors with cross-section clustering. The open unemployment rate and HDI are also not statistically significant. These findings indicate that short-term regional growth in South Sulawesi is weakly explained by poverty, unemployment, and human development indicators alone. Instead, growth variation is likely shaped by broader structural factors, including sectoral composition, investment, government expenditure, infrastructure, commodity dynamics, fiscal capacity, and local recovery capacity.

From an Islamic economics perspective, the findings imply that regional development should not be evaluated solely through GRDP growth, but also through distributive justice, poverty reduction, productive employment, and welfare improvement. Local governments should promote higher-quality, more inclusive,

and labor-absorbing growth that strengthens the productive capacity of poor and vulnerable groups. Although Islamic social finance was not directly estimated in the model, zakat, waqf, Islamic microfinance, and related instruments may complement public policy by supporting productive empowerment and financial inclusion. Future research should extend the observation period, incorporate structural variables such as investment, public expenditure, infrastructure, and sectoral composition, and consider spatial or dynamic panel approaches to capture regional spillovers and long-term development dynamics.

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