

## DETERMINANTS OF POVERTY: IMPACTS OF ZIS, HUMAN DEVELOPMENT, ECONOMIC GROWTH, AND ICT

Wilda Hanifah<sup>1</sup>, Nofrianto<sup>2</sup> and Muhammad Hasbi Zaenal<sup>3</sup>

<sup>123</sup> UIN Syarif Hidayatullah Jakarta.

Paper was presented at the 9th International Conference on Zakat (ICONZ)

9 – 12 December 2025, Jakarta, Indonesia

### ABSTRACT

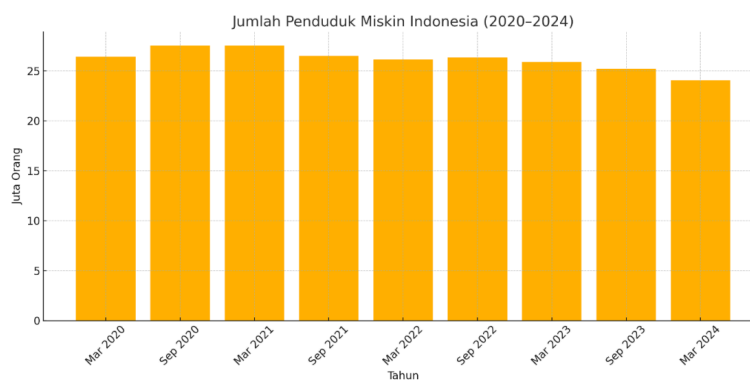
*This study analyzes the effects of ZIS, Human Development Index (HDI), GRDP, and ICT Development Index on poverty in 34 Indonesian provinces during 2020–2023. Panel data regression with the Fixed Effect Model (FEM) was used because it best captured the provincial characteristics. ZIS and HDI significantly reduce poverty, GRDP is not significant, while ICT index increases poverty due to digital inequality. The study is limited to macro-provincial data and does not evaluate household-level mechanisms. Results guide policymakers on strengthening ZIS management, human development, and inclusive digital expansion. Strengthening social redistribution and human capital can accelerate poverty reduction. This study integrates ZIS, HDI, GRDP, and ICT in a single nationwide panel analysis.*

**Keywords :** Poverty, ZIS, Human Development Index, GRDP, ICT, FEM.

### I. INTRODUCTION

Poverty is still a fundamental problem in Indonesia's development. Although the national poverty rate continues to decline, interprovincial disparities remain high, especially between the Java-Sumatra region and the Eastern region of Indonesia (BPS Indonesia, 2023) This condition shows that economic growth is not always followed by equal distribution of welfare. Therefore, an analysis of the factors that affect poverty needs to be carried out comprehensively.

**Figure 1: Number of Indonesia's Poor (2020-2024)**



The Zakat, Infaq, and Sadaqah (ZIS) instrument is one of the distribution mechanisms of the Islamic economy that is able to improve the welfare of the poor through consumptive and productive programs. Recent research shows that ZIS has been proven to reduce inequality and increase mustahik income when managed effectively (Putra & Asdi, 2021). In addition, the quality of human

development reflected in HDI is still the main indicator that affects people's ability to get out of poverty. Empirical studies show that education, health, and a decent standard of living have a significant impact on poverty reduction in Indonesia (Setiawan et al., 2020).

On the other hand, GDP is often used as an indicator of regional economic success. However, a number of studies have found that GDP growth is not always effective in reducing poverty when it is not followed by equitable distribution and inclusive access (Suryani & Rahayu, 2022). Meanwhile, technological developments through the improvement of IP-ICT have the potential to expand access to information and economic opportunities. But *digital divide* resulting in the benefits of technology not being felt evenly, especially by the poor (Hasanah & Yusuf, 2023).

Based on these gaps, this research was conducted to fill empirical gaps related to the role of ZIS, HDIM, GDP, and IP-ICT in poverty at the provincial level. In addition, the use of panel data from 34 provinces during 2020–2023 provides a stronger picture of the dynamics of poverty in the era of digitalization and post-pandemic recovery. This research is important because it can provide more appropriate policy recommendations for local governments and ZIS management agencies to develop more effective and inclusive poverty alleviation programs

## II. LITERATURE REVIEW

### 1. Poverty

Poverty is a condition when individuals or households do not have adequate ability to meet basic needs, including adequate food, health, education, and access to decent housing. In the framework of modern development, poverty is understood as a multidimensional phenomenon that is not only related to low income, but also concerns limited access to economic resources, employment opportunities, information, and essential public services. Indonesian Central Statistics Agency (2023) emphasizing that poverty is influenced by a combination of income factors, the availability of basic services, and the quality of human resources, so that the approach cannot be simplified only on economic aspects.

Various empirical studies show that the determinants of poverty include social, economic, and technological factors that interact with each other and influence each other (Setiawan et al., 2020). Suryani & Rahayu (2022) identify that poverty in Indonesia is still dominated by structural factors, especially education gaps, inequality in health services, and sustainability *digital divide* which limits the ability of low-income people to access wider economic opportunities. On the other hand, social interventions based on the distribution of productive income, such as zakat, infaq, and alms programs, have been proven to have a significant effect in reducing poverty rates through increasing the economic capacity of recipient households (Putra & Asdi, 2021).

In addition, research conducted by Hasanah & Yusuf (2023) emphasizing that the ability to adapt and utilize information technology is an important determinant for increasing the productivity and economic competitiveness of the poor. Regions that experience delays in digital transformation tend to show higher poverty rates, considering that access to technology plays an important role in opening up business opportunities, expanding information networks, and increasing the efficiency of economic activities. Thus, today's poverty dynamics demand a more comprehensive policy approach through the simultaneous and sustainable integration of social, economic, and technological aspects.

### 2. Zakat, Infaq, and Sadaqah (ZIS)

Zakat, Infaq, and Alms (ZIS) are instruments of wealth distribution in the Islamic economic system that play a strategic role in reducing inequality through a planned and equitable redistribution mechanism. Theoretically, ZIS is positioned as an instrument of income equity as well as a means of economic empowerment for low-income groups. Putra &

Asdi (2021) stated that the productive management of ZIS can increase the economic capacity of mustahik and have a significant impact on reducing poverty levels. In line with this, Hafidhuddin (2020) emphasized that the zakat-based empowerment model has the potential to increase people's purchasing power and encourage sustainable economic transformation.

Research conducted by Hasanah & Yusuf (2023) also broadened the understanding of the role of Islamic social funds by showing that ZIS has a positive contribution to the development of the economic capacity of marginalized communities, especially through the implementation of social fund-based entrepreneurship programs. The findings confirm that ZIS does not solely function as a charitable mechanism, but also as an effective social development instrument in creating long-term welfare improvements. Thus, optimizing the management of ZIS is one of the important strategies in strengthening the economic independence of vulnerable communities and accelerating the process of structural poverty alleviation.

Hypothesis: H<sub>1</sub>: ZIS has a negative effect on poverty.

### **3. Human Development Index (HDI)**

The Human Development Index (HDI) is a composite indicator that describes human development achievements through three main dimensions, namely education, health, and decent living standards. In development theory, improving human quality through adequate education and optimal health is believed to expand economic opportunities and improve the ability of individuals to get out of poverty. Research conducted Setiawan et al., (2020) shows that increasing HDI has a significant influence on reducing poverty rates in Indonesia. The findings are reinforced by studies Ridwan & Salim (2022) which revealed that areas with low HDI levels generally have higher poverty rates due to limited access to basic services.

Furthermore, the results of the study Nugroho (2021) confirming the existence of a causal relationship between improving human quality and labor productivity. Increasing HDI is considered to be able to strengthen individual economic capabilities so that it has a direct impact on reducing poverty rates. Based on these empirical findings, HDI is seen as one of the main determinants that affect the level of community welfare.

Hypothesis: H<sub>2</sub>: HDI has a negative effect on poverty.

### **4. Gross Regional Domestic Product (GDP)**

Gross Regional Domestic Product (GDP) is a macroeconomic indicator used to measure the level of economic growth of a region. Theoretically, an increase in GDP describes an increase in economic activity which in turn has the potential to increase people's income and reduce poverty rates. However, various studies show that economic growth is not always inclusive. Suryani & Rahayu (2022) states that the influence of GDP on poverty is highly dependent on the extent to which the growth is followed by the equitable distribution of income in a region. Setiawan et al., (2020) It also found that economic growth can fail to reduce poverty if the benefits are concentrated in certain groups of people and not distributed evenly.

Next Arsyad et al. (2021) emphasized that new economic growth will have a significant impact on reducing poverty if accompanied by increased productivity and equal access to job opportunities. This indicates that the influence of GDP on poverty is not uniform, but can vary between regions depending on the economic structure, income distribution, and productive capacity of

the local community. Thus, the relevance of GDP as a determinant of poverty reduction is largely determined by the dimensions of equity and the quality of growth that occurs in a region.

Hypothesis: H<sub>3</sub>: GDP has a negative effect on poverty.

### 5. Information and Communication Technology Development Index (IP-ICT)

IP-ICT describes the ability of a region to develop and utilize digital technology. Technological developments have the potential to expand economic opportunities, increase access to information, and strengthen productivity. However, the digital divide is often an obstacle. Hasanah & Yusuf (2023) stating that inequality of access to technology causes the benefits of digitalization to only be enjoyed by certain groups, thus widening the gap. E. Siregar (2022) It also found that provinces with low access to technology have higher poverty rates due to limited digital-based economic opportunities.

Research Rahman et al. (2022) strengthening that the use of technology can encourage inclusive economic growth when followed by increasing digital literacy. Therefore, the influence of IP-ICT on poverty is highly dependent on equal access and people's adaptability.

Hypothesis: H<sub>4</sub>: IP-ICT has an effect on poverty

## III. METHODOLOGY

This study uses panel data to analyze the relationship between Zakat, Infaq, and Alms (ZIS), Human Development Index (HDI), Gross Regional Domestic Product (GDP), Information and Communication Technology Development Index (IP-ICT), and poverty levels in Indonesia. The population of this study covers all provinces in Indonesia. However, based on the availability and completeness of data during the observation period, as many as 34 provinces were selected as research samples. The sample selection was carried out using the purposive sampling method by considering the availability of ZIS, HDI, GDP, IP-IC, and poverty data from 2020 to 2023.

The research data was processed using the EViews 12 software, and the analysis tools used included descriptive statistics, panel data regression, and classical assumption tests. The panel data regression model was used to determine the partial and simultaneous influence of ZIS, HDIM, GDP, and IP-ICT variables on poverty levels at the provincial level. To determine the most appropriate panel model, this study applied three types of tests, namely the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test. Based on the results of the three tests, the model chosen as the main analysis model is the Fixed Effect Model (FEM).

## IV. RESULTS AND DISCUSSION

### Descriptive Analysis

The results of descriptive statistical analysis for 34 provinces in Indonesia during the 2020–2023 period are presented in Table 1. This analysis provides an overview of the distribution of values from the variables of poverty, ZIS, DIPM, GDP, and IP-ICT used in the study. The statistical components displayed include minimum, maximum, mean, and standard deviation.

**Table 1. Descriptive Analysis**

VARIABLE	POVERTY	IPM	PDRB	ZIS	IP-ONLY
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MIN	4,250	60,440	10,639	17,525	3,220
MAK	27,380	82,460	15,052	26,949	7,460
MEAN	10,405	71,900	12,484	23,091	5,837
Std.Dev	5,271	3,722	1,135	2,068	0,658

Source: Processed data views

### Panel Method

The selection of the most appropriate panel regression model for this analysis was based on the results of three commonly used statistical tests: the Chow test, the Hausman test, and the Lagrange Multiplier (LM) test. These three tests are important to determine the appropriate model by evaluating different aspects of the panel's data structure and the underlying assumptions. The results of the three tests, which help identify the most appropriate regression model, are presented in Table 2.

**Table 2. Regression Model**

No	Test	Result	Significance value	Model
1	Chow	0,0000	<0.05	FEM
2	Hausman	0.0016	<0.05	FEM
3	LM	-	-	-

Source: Processed data views

The results of Chow's test showed a p-value of **0.0000**, which was significantly smaller than the significance threshold of 0.05. These findings indicate that the Fixed Effect (FEM) model is more appropriate than the Pooled model. Furthermore, the Hausman test gives a p-value of 0.0016, which is also smaller than 0.05, thus confirming the consistency that the Fixed Effect Model is more accurate than the Random Effect Model. Given that both tests (Chow and Hausman) have shown consistent results leading to FEM, the Lagrange Multiplier (LM) test that is usually used to detect random effects is considered unnecessary in the context of these test results.

Based on these findings, the model chosen for the panel data analysis in this study is the Fixed Effect Model (FEM). Thus, the analysis was then continued using FEM to estimate the influence of ZIS, HDIM, GDP, and IP-ICT variables on poverty levels in Indonesian provinces.

### Interpretation of the Selected Model Results

The Fixed Effect (FEM) model was determined as the most suitable panel regression model based on the results of the previous Chow and Hausman tests. The use of FEM in the regression analysis of panel data assumes that each observation unit has a different but constant interception during the observation period. The results of regression estimation using FEM are shown in Table 3.

**Table 3. Fixed Effect Model**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.29960	3.389252	4.809203	0.0000

ZIS	-0.199617	0.037025	-5.391414	0.0000
IPM	-0.789403	0.066220	-3.188826	0.0020
PDRB	0.175445	0.250888	0.699360	0.4856
IP_TIK	0.365989	0.109203	3.356594	0.0011
R-squared			0.997588	
Adjusted R-squared			0.996867	
F-statistic			1084.9377	
Prob(F-statistic)			0.000000	

**Source: Processed data eviws**

The results of the Fixed Effect (FEM) model estimation in Table 3 show that constant (C) is statistically significant with a coefficient of 16.29960, which indicates a strong underlying influence on the poverty variable when all independent variables are zero. The ZIS variable has a coefficient of -0.199617 with a probability value of 0.0000, indicating a negative and significant influence on poverty. This means that the increase in ZIS funds contributes to a reduction in poverty rates in all provinces.

Meanwhile, the HDI variable also showed a negative and significant influence with a coefficient of -0.789403 and a probability value of 0.0020. These findings illustrate that the higher the level of human development, the lower the poverty rate in an area. On the other hand, the GDP variable has a coefficient of 0.175445 with a probability value of 0.4856, which means that it has no significant influence on poverty at a significance level of 5%. The IP-ICT variable shows a coefficient of 0.365989 with a probability value of 0.0011, which indicates a positive and significant influence on poverty. This can be interpreted that the development of information technology has not been evenly distributed so that it has not been able to reduce poverty optimally.

The research model shows a very strong match rate with an R-squared value of 0.997588, which means that 99.75% of poverty variations can be explained by the ZIS, IPM, GDP, and IP-ICT variables. In addition, the F-statistical value of 1084.9377 with a probability of 0.000000 indicates that the model as a whole is significant, so that the independent variables used have a co-effect on the poverty variable.

### T Test

Table 4 presents the results of the t-test with a significance level of 5% to see the influence of each independent variable on the poverty variable. These results show which variables have a significant or insignificant influence on poverty at the provincial level in Indonesia during the study period.

**Table 4. T Test Results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.29960	3.389252	4.809203	0.0000

<b>ZIS</b>	-0.199617	0.037025	-5.391414	0.0000
<b>IPM</b>	-0.789403	0.066220	-3.188826	0.0020
<b>PDRB</b>	0.175445	0.250888	0.699360	0.4856
<b>IP_TIK</b>	0.365989	0.109203	3.356594	0.0011

**Source: Processed data eviws**

Based on the results in Table 4, the ZIS variable has a coefficient of  $-0.199617$  with a t-statistical value of  $-5.391144$  and a p-value of  $0.0000$ , indicating that ZIS has a negative and significant effect on the poverty rate. This means that the higher the distribution of ZIS, the lower the poverty rate. Furthermore, the HDI variable showed a coefficient of  $-0.789403$  with a p-value of  $0.0020$ , so it had a negative and significant effect on poverty. This shows that improving the quality of human development is able to reduce poverty levels in various provinces. In contrast, the GDP variable has a coefficient of  $0.175445$  and a p-value of  $0.4856$ , so it does not have a significant effect on poverty. This indicates that an increase in GDP does not necessarily have a direct impact on poverty reduction if it is not followed by economic equity.

Meanwhile, the IP-ICT variable showed a coefficient of  $0.365989$  with a p-value of  $0.0011$ , indicating a positive and significant influence. This shows that the development of information and communication technology has not been able to reduce poverty evenly; It can even increase if access to technology is uneven.

#### **Test F**

The results of the F test shown in Table 5 show a probability value of  $0.000000$ , which is well below the significance level of  $0.05$ . This indicates that the independent variables used in this study ZIS, HDIM, GDP, and IP-ICT simultaneously have a significant effect on the dependent variable, namely the poverty rate. In other words, these four variables together can explain the variation in changes in poverty rates in 34 provinces in Indonesia during the observation period.

**Table 5. Test F**

F-statistic	1084.9377
Prob(F-statistic)	0.000000

**Source: Processed data eviws**

The results of the F test in Table 5 show an F-statistical value of  $1084.9377$  with a p-value of  $0.000000$ . Since the p-value is smaller than the significance level of  $0.05$ , it can be concluded that all independent variables in the model have a significant simultaneous influence on poverty levels. These findings confirm that the model used is able to effectively capture the combined influence of ZIS, IPM, PDRB, and IP-ICT variables.

#### **Coefficient of Determination Test ( $R^2$ )**

The  $R^2$  test measures how much variation in the dependent variables can be explained by the independent variables in the model. The value of the determination coefficient is in the range of  $0$  to  $1$ , where a higher value indicates the model's better ability to explain the variation of the data.

**Tabel 6. Coefficient of Determination Test (R<sup>2</sup>)**

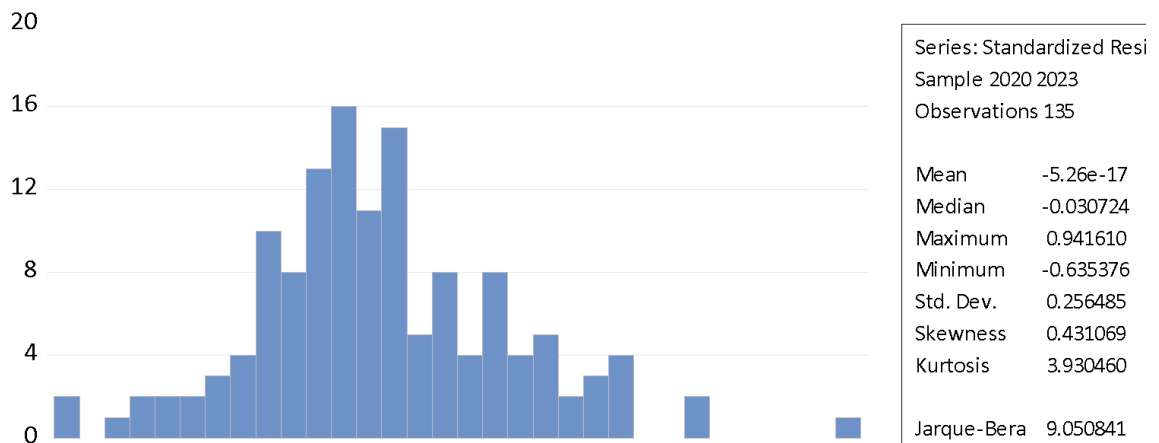
R-squared	0.997588
Adjusted R-squared	0.996867

**Source: Processed data eviws**

The results in Table 6 show that the R-squared value is 0.997588, which means that about 99.76% of the variation in poverty rate can be explained by the ZIS, HDIM, GDP, and IP-ICT variables. The Adjusted R-squared value of 0.996867 is also very high, confirming that this model has very strong explanatory abilities. With an almost perfect determination value, the FEM model can be said to be very good in describing the relationships between variables in this study.

**Classic Assumption Test**

**Normality Test**



The results of the Jarque–Bera test showed a JB value = 9.05 with a p-value = 0.01083, so that the residual was not normally distributed at a significance level of 5%. The values of skewness (0.431) and kurtosis (3.93) also indicate a deviation from normality. However, because the number of observations is quite large, the residual abnormalities do not interfere with the validity of the FEM model, and the estimators remain consistent. Thus, the model can still be used for inferential analysis.

**Multicollinearity Test**

	ZIS	IPM	IP_TIK	PDRB
ZIS	1	0.4143043571671318	0.4660129544529673	0.5701380252593139
IPM	0.4143043571671318	1	0.7215636018394276	0.4744481430260277
IP_TIK	0.4660129544529673	0.7215636018394276	1	0.4026486045188193

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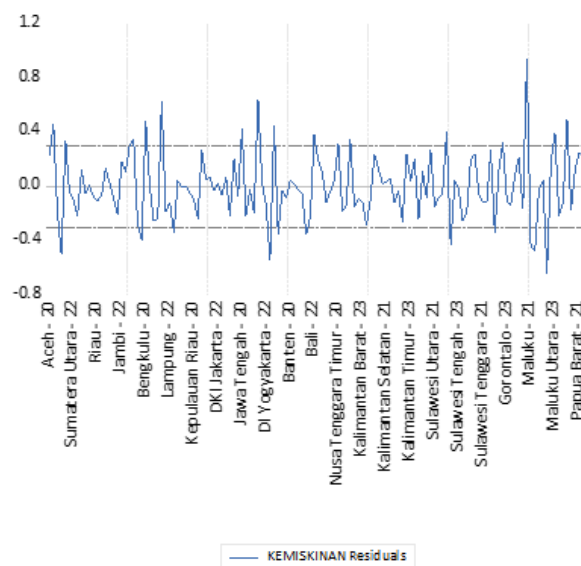
<b>PDRB</b>	0.5701380252593139	0.4744481430260277	0.4026486045188193	1
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The Multicollinearity test was carried out by looking at the correlation matrix between independent variables. The results of the analysis showed that the entire correlation value was in the range of 0.40–0.72, which means that it was still below the threshold of strong multicollinearity ( $\geq 0.80$ ). The highest correlation was seen between HDI and IP-ICT at 0.721, but this value remained within the tolerance limit so that it did not cause serious multicollinearity problems. Correlation between other variables, such as between ZIS and GDP (0.570) or ZIS and IP-ICT (0.466), falls into the moderate category and does not interfere with the stability of the model.

Thus, it can be concluded that the regression model does not contain annoying multicollinearity, so all independent variables are worth preserving in the estimation model. The reliability and interpretation of the regression coefficient remains valid because there are no high linear relationships that have the potential to distort the test results.

### Heteroscedasticity Test



The heteroscedasticity test was carried out by observing the residual distribution pattern on the graph. Based on the residual image of poverty during the 2020–2023 period, it can be seen that the residual value fluctuates randomly around zero without showing a specific pattern, such as fanning out, narrowing, or an upward-decreasing trend at observation points between regions. This relatively constant residual spread indicates that the residual variance is homogeneous, so there are no symptoms of heteroscedasticity in the model.

The absence of this systematic pattern indicates that the model meets the assumption of homoskedasticity, so that the regression coefficient estimation can be considered efficient and the resulting error standard remains reliable for significance test purposes. Thus, classical assumptions regarding the similarity of residual variance are met, and the model can be used for inferential analysis without the need for additional adjustments, such as the use of robust standard errors.

### Autocorrelation Test

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Durbin-Watson stat

2.083743

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The results of the autocorrelation test showed a Durbin–Watson (DW) value of 2.083743. This value is very close to the number 2, which is the equilibrium point in the absence of autocorrelation. Thus, it can be concluded that the model does not experience autocorrelation, either positively or negatively. The absence of autocorrelation indicates that the residual is independent between time and between observations, so the panel regression model estimation used can be considered stable, valid, and unbiased due to residual correlation.

## V. DISCUSSION

The fixed-effect panel regression model used showed a very high match rate ( $R^2=0.9976$ , Adjusted  $R^2=0.9969$ ) and an F-statistic of 1084.94 ( $p<0.001$ ), indicating that the variables ZIS, IPM, GDRB, and IP-ICT simultaneously had a significant effect on the variability of the provincial poverty level (although very high  $R^2$  values need to be aware of the possibility of fixed effects or multicollinearity). The results of the partial t-test indicated that ZIS, HDI, and IP-ICT were significant ( $p<0.01$ ), while the GDP was not significant. Furthermore, the discussion focused on the interpretation of the coefficients of each variable within the framework of economic theory, public policy, and regional dynamics.

### **The Influence of ZIS (Zakat, Infaq, Shadaqah) on the Poverty Level**

The results of the analysis showed that Zakat, Infaq, and Alms (ZIS) had a negative and significant effect on poverty levels, indicating that Islamic philanthropic interventions can play a role as an effective redistribution instrument when operationalized through institutional mechanisms and targeted empowerment programs. Theoretically, ZIS works through at least two pathways: (1) direct consumption transfers that reduce the shortages of poor households' basic needs and reduce short-term vulnerability; and (2) productive interventions micro business capital, training, and inclusive financing that increase mustahik income capacity and potential long-term economic mobility Atasoge (2021) and Karunia & Amir (2024). The effectiveness of ZIS is highly dependent on the quality of amil governance, mustahik data accuracy, and program design (Lazism Blow, 2025). emphasizing that the institutionalization of zakat distribution through standardization of recipient criteria, data-based monitoring, and accountability strengthens the impact of poverty alleviation. However, empirical evidence suggests a heterogeneity of effects between regions: some studies have found negative but insignificant effects in local contexts highlighting weaknesses in regional distribution capacities (Ulandari et al., 2024). Study Princess (2025) found that the ZIS variable was not significant in the national context of 34 Indonesian provinces in the period studied, which shows that the potential of ZIS has not been fully realized as a tool for poverty alleviation. These differences can be caused by the quality of mustahik data collection, the professionalism of amil zakat, the scope of empowerment programs, and the involvement of muzaki. while other research highlights positive outcomes when ZIS is oriented productively and integrated with local market networks (Karunia & Amir, 2024) ; (Ayati N. & Khusnudin, 2025)). The policy implications that emerge from these findings are the need for a dual strategy: strengthening the function of ZIS as a *social safety net* to reduce acute poverty while increasing allocations for productive programs that can create sustainable incomes; Digital integration in zakat management is also recommended to increase targeting and transparency (Muhafidin, 2023). Methodologically, follow-up research is recommended using longitudinal household data to examine the long-term effects of ZIS on mobility out of poverty and conduct a mediated analysis that unravels the role of productive programs, so that policies can be designed based on stronger evidence of causal mechanisms.

### **The Effect of HDI (Human Development Index) on Poverty Levels**

The HDI coefficient of  $-0.7894$  ( $t = -3.19$ ,  $p = 0.002$ ) was significantly negative, meaning that provinces with higher HDI tended to have lower poverty rates. The results of the study show that the Human Development Index (HDI) has a negative and significant influence on the poverty rate. These findings confirm that improvements in quality of life reflected in the dimensions of education, health, and real expenditure per capita contribute directly to the reduction of structural and transitional poverty. Rahmawati & Hadi, (2021) found that the increase in education indicators in HDI, especially the average length of schooling, consistently reduced the poverty rate between regions in Indonesia by increasing more productive job opportunities. Next Sari & Fitriani (2022) emphasizes that education has a dual impact: in addition to improving the quality of the workforce, education also expands the adaptability of individuals to changes in the labor market, especially in the digital age. The health dimension is a long-term economic resilience, especially in provinces with low public service development indexes.

In addition, various studies confirm that the three components of HDI not only affect poverty individually, but simultaneously work as *capability enabler*. Widodo & Saputra (2020) emphasized that the formation of basic capabilities through education and health forms the foundation for income stability and increased social mobility between generations. Therefore, provinces with high HDI tend to have more competitive economic structures and lower inequality, thus facilitating poverty reduction. This is reinforced by the latest human development report which states that improving human capabilities has a long-term impact compared to cash assistance-based policies (UNDP, 2024).

Thus, the results of this study confirm the theory that increasing HDI is a fundamental approach to accelerate poverty reduction. Public policies that expand access to education, improve the quality of health services, and strengthen people's purchasing power have proven to be the most effective and sustainable instruments in encouraging mobility out of poverty. The combination of policies also allows poor households to reduce their exposure to economic shocks and increase their chances of entering a more stable formal sector. Therefore, the fulfillment of human development standards needs to be a top priority in the national poverty alleviation strategy.

### **The Effect of GDP (Gross Regional Domestic Product) on Poverty Rates**

The results of the study show that the Gross Regional Domestic Product (GDP) has a positive coefficient of  $0.175445$  with *p-value*  $0.4856$ , which means no significant effect between GDP growth and provincial poverty levels in Indonesia. These findings reinforce empirical evidence that aggregate economic growth is not always able to reduce poverty directly, even in some contexts it has the potential to widen inequality. According to Aulia & Rachman (2021) Indonesia's economic growth over the past decade has tended to be supported by non-labor-intensive sectors such as mining and extractive industries, which have had a limited impact on the absorption of poor labor. Thus, increasing GDP does not necessarily improve the welfare of vulnerable groups.

Furthermore, Happy & Happy (2022) emphasized that the contribution of GDP to poverty reduction requires certain conditions, namely the low level of inequality and the high capacity of the labor-intensive MSME sector. If the economic structure of a region is dualistic where the modern sector grows rapidly while the traditional sector is stagnant, GDP growth actually flows to the upper-middle group without touching the poor group. This is in line with the findings Hasan & Nurzaman (2023) that regional economic growth is often not inclusive due to weak income distribution mechanisms and the lack of integration of the informal sector into productive economic activities.

These results are also consistent with the study Fadilah & Kuswanto (2024) which shows that areas with high levels of urbanization such as West Java and East Kalimantan experienced large GDP

growth but were not followed by significant improvements in poverty indicators. The cause is the dominance of extractive or manufacturing industries that produce high added value but have value chains that are not connected to the poor household sector. As a result, the poor still find it difficult to access economic opportunities despite rapid growth.

The insignificance of GDP in this study indicates that economic growth must be inclusive (*inclusive growth*) in order to be able to significantly reduce poverty. The inclusive growth model emphasizes equal access to education, health, business credit, and employment opportunities. In the context of Indonesia, Y. Siregar & Putri (2021) stated that the impact of economic growth on poverty is only felt when local governments actively expand access to MSMEs, strengthen village infrastructure, and improve the quality of labor in poor areas. Without these efforts, GDP growth is only a macro indicator that is not directly related to the welfare of the poor.

Overall, the results of this study confirm that GDP is not a strong determinant of poverty without supporting policies that are able to ensure that the benefits of growth are evenly distributed. The government needs to integrate poverty reduction strategies with regional economic development policies through the expansion of labor-intensive employment, local supply chain reform, increased productivity of MSMEs, and equitable distribution of basic infrastructure. These findings also refute the classic assumption that economic growth automatically reduces poverty, and highlight the need for a more comprehensive and inclusive approach to development.

### **The Influence of IP-ICT (Information and Communication Technology Development Index) on Poverty Levels**

The positive IP-ICT coefficient was 0.3660 ( $t = 3.36$ ,  $p = 0.0011$ ), which means that the increase in the ICT index is associated with an increase in poverty. The results of the study show that the IP-ICT variable has a positive and significant effect on the poverty rate, which means that the increase in ICT development is followed by an increase in poverty in many provinces. These findings are in stark contrast to the common theory that technology accelerates the diffusion of information and opens up economic access. However, Indonesia's condition shows a different pattern, where the progress of ICT infrastructure is not always followed by the capacity of the poor to make optimal use of it. According to Nurcholis & Amalia (2021) The inequality of digital literacy between high- and low-income groups has caused the expansion of the internet network to actually widen the social and economic gap. In other words, access exists, but the ability to leverage that access is uneven.

In addition, the cost structure of using digital technology is also an important factor. Fadli & Sari (2022) found that the cost of digital devices, data packages, and support services is still too high for poor households, so ICT penetration does not automatically provide economic benefits. On the contrary, ICT access tends to benefit groups that already have educational and financial capital. As a result, IP-ICT is increasing, but the proportion of poor households that can take advantage of technology remains low. This is also reinforced by studies Suyanto & Widyaningsih (2023) which states that regional economic digitalization is only effective in reducing poverty when accompanied by increasing people's digital capacity and literacy programs targeting vulnerable groups.

Another aspect that explains the significant positive outcomes is urban bias. According to research by Hermawan & Ristanti (2024) the growth of ICT infrastructure is concentrated in urban areas, while rural areas with higher poverty rates experience delays in adoption. This geographical inequality widens the development gap between regions. Even in some provinces, such as Papua and NTT, the increase in the ICT index reflects more of the growth of government and commercial facilities, without having a significant impact on poor household incomes. In such a context, the increase in IP-ICT does not automatically reflect the digital empowerment of the poor.

Overall, the results of the study show that technology is only a "tool for poverty alleviation" when accompanied by supporting factors, such as digital literacy, device access, network stability, and integration of ICT with the economic activities of poor households. Without these four factors, the increase in IP-ICT actually thickens the *digital divide*, which ultimately increases inequality and slows down poverty reduction. Therefore, ICT development policies need to be directed towards inclusive digital strategies: basic digital training, device or internet subsidies for poor households, as well as the development of digital economy platforms that can be accessed by grassroots communities. The findings of this study emphasize that ICT development must be inclusive, not just expansive, so that its function in encouraging poverty reduction can be realized.

## VI. CONCLUSIONS AND RECOMMENDATION

Based on the results of the analysis and processing of research data, it can be concluded that social, economic, and technological dynamics have different contributions in influencing the poverty level of provinces in Indonesia during the 2020–2023 period. The findings of the study show that the variables of Zakat, Infaq, and Sadaqah (ZIS) have a negative and significant influence on poverty. This emphasizes that the higher the effectiveness of the distribution of ZIS in the charitable aspect and its empowerment, the lower the poverty rate in a region. Thus, the role of Islamic philanthropy has proven to be an effective instrument of income redistribution if supported by professional institutional governance and targeted empowerment programs.

In addition, the study also found that the Human Development Index (HDI) has a negative and significant effect on poverty. Improving the quality of life, especially through education, health, and purchasing power, has been shown to contribute strongly to reducing the economic vulnerability of poor households. These findings strengthen the human development approach as a long-term strategy in overcoming structural poverty in Indonesia.

In contrast to the previous two variables, the Gross Regional Domestic Product (GDP) did not show a significant influence on poverty in the study period. This insignificance implies that aggregate economic growth does not automatically trickle *down* to the poor. Growth centered on the intensive capital sector and high income inequality make the increase in GDP unable to directly reduce poverty. This indicates that the quality of growth is not just the amount of growth that must be considered in the formulation of regional economic policies.

Furthermore, the Information and Communication Technology Development Index (IP-ICT) actually shows a positive and significant influence on poverty. These findings indicate that infrastructure improvement and ICT utilization are not yet fully inclusive. The *digital divide*, limited digital literacy, and concentration of ICT development in urban areas make poor groups unable to utilize technology to improve their economic welfare. As a result, the growth of IP-ICT tends to widen inequality and hinder poverty reduction.

Overall, this study shows that poverty reduction in Indonesia is not only determined by economic growth, but also by the effectiveness of socio-religious programs, human development, and the inclusive nature of technological advances. These findings provide important implications for policy formulation: improving HDI and optimizing ZIS needs to be a priority; economic development must be geared towards inclusive growth; And digital transformation must be designed with a partisan approach (*pro-poor digital policy*) so that the benefits of technology can be felt equally by the community. Thus, poverty alleviation strategies need to be placed in a multidimensional framework that integrates social, economic, and technological aspects in a sustainable manner.

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