Content lists available at SRN Intellectual Resources

International Journal of Advances in Social Sciences and Humanities

Journal homepage: https://journal.srnintellectual.com/index.php/ijassh

Original Article

Determinants of Poverty in Aceh Province: The Moderating Role of Zakat, Infaq, and Sadaqah

Cut Syazalisma [a], M. Shabri Abd. Majid [a], Suriani Suriani [a,*]

[a] Department of Economics, Faculty of Economics and Business, Universitas Syiah Kuala, Syiah Kuala, 23111 Kota Banda Aceh, Aceh, Indonesia; cut.syazalisma@gmail.com (C.S.), mshabri@usk.ac,id (S.A)

* Correspondence author: suriani@usk.ac.id (S.S.)

Citations: Syazalisma, C., Majid, M.S.A., & Suriani, S., (2024). Determinants of Poverty in Aceh Province: The Moderating Role of Zakat, Infaq, and Sadaqah. *International Journal of Advances in Social Sciences and Humanities*, *3*(3), 177-193.

Received: 24 April 2024 Revised: 16 July 2024 Accepted: 9 August 2024 Published: 31 August 2024

Abstract: This study examines the impact of the Human Development Index (HDI), labor force participation, and infrastructure expenditure on poverty levels in Aceh Province, with zakat, infaq, and Sadaqah serving as moderating variables. Utilizing secondary data, the research employs panel regression methods and Moderated Regression Analysis (MRA) to analyze data collected from 23 districts and cities in Aceh Province over the 2008–2022 period. The findings reveal that the HDI and labor force participation rate do not significantly influence poverty in Aceh. However, infrastructure expenditure demonstrates a negative and statistically significant effect, indicating its potential to reduce poverty in the region. Furthermore, zakat, infaq, and sadaqah can moderate the effects of HDI and infrastructure expenditure on poverty but fail to moderate the relationship between labor force participation and poverty. Based on these results, it is recommended that the Aceh Provincial Government adopt more targeted and comprehensive strategies to alleviate poverty. Efforts should focus on enhancing the HDI and labor force participation rates, alongside optimizing the collection and allocation of zakat, infaq, and Sadaqah, and increasing infrastructure investment. Such measures can potentially address the persistent issue of poverty in Aceh Province more effectively.

Keywords: Poverty; Human Development Index; Labor force participation; Infrastructure spending; Zakat, Infaq and Sadaqah

1. Introduction

Poverty remains a critical challenge in achieving sustainable development, particularly in developing countries. Its negative consequences, such as environmental degradation (Nguyen & Kakinaka, 2019), rising crime rates (Cuthbertson, 2018; Fitriady et al., 2022), and disparities in access to education and healthcare (Price et al., 2018), underscore the urgency of addressing this issue. According to the World Bank (2023), nearly 700 million people globally are projected to live in extreme poverty by 2023, subsisting on less than $2.15 per day. Achieving the first goal of the Sustainable Development Goals (SDGs)—eradicating extreme poverty by 2030 and reducing the global poverty rate by half—requires significant and sustained effort (UN, 2015). In this context, poverty remains a compelling area of research. Indonesia, for instance, continues to face substantial challenges in poverty alleviation. Although the national poverty rate declined from 11.37% in 2013 to 9.54% in 2022, the absolute number of people living in poverty remains high. In 2022, approximately 26.16 million Indonesians were classified as poor, with 6.59 million categorized as

e-ISSN: 2948-4723 @ 2024 SRN Intellectual Resources
DOI: 10.56225/ijassh.v3i3.336

extremely poor, reflecting an extreme poverty rate of 2.04% (Kemenkopmk, 2023). To address this, the Indonesian government issued Presidential Instruction No. 4 of 2022, focusing on accelerating the elimination of extreme poverty with the ambitious goal of eradicating it entirely by 2024. This initiative highlights the pressing need for effective policies and interventions to achieve meaningful progress in poverty reduction. .

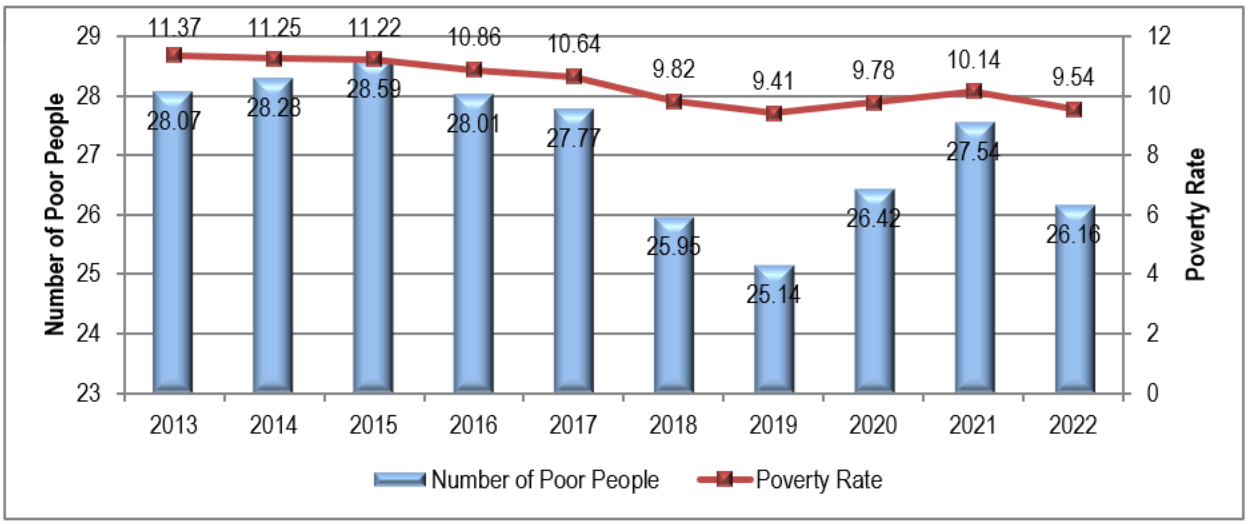

Figure 1. Development of Poverty Level and Number of Poor People in Indonesia in 2013-2022

Source: Central Bureau of Statistics (2022)

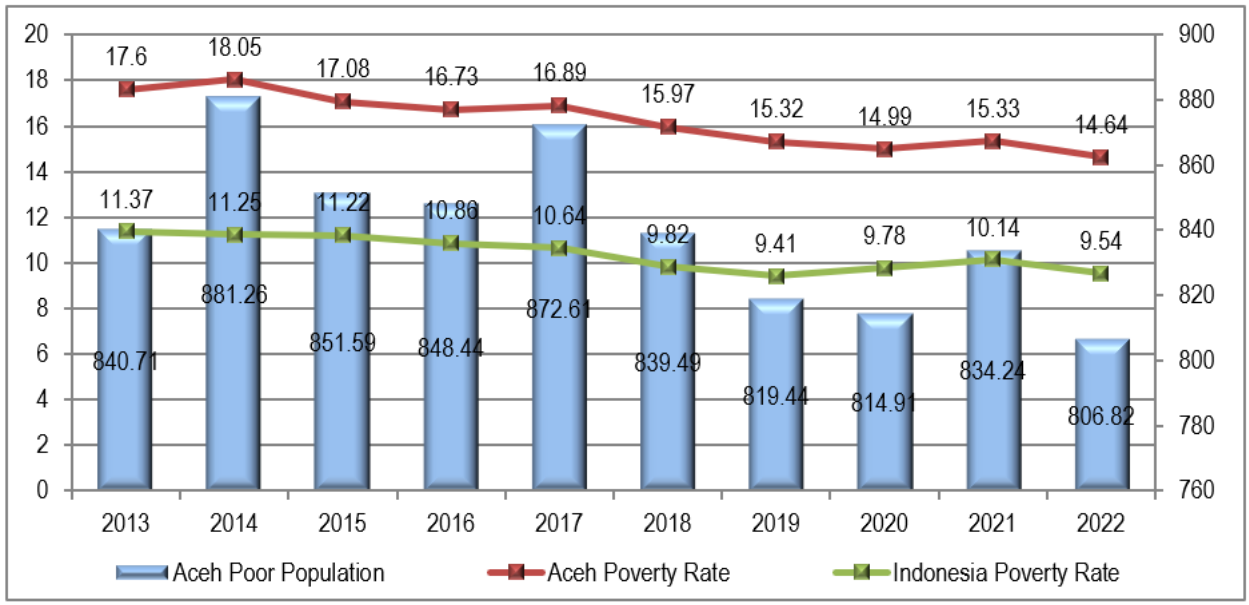

Figure 2. Poverty Rate and Number of Poor People in Aceh Province and Indonesia Poverty Rate 2013-2022

Source: Central Bureau of Statistics (2022)

Aceh Province is one of the regions contributing significantly to Indonesia's poverty rate. In 2022, the poverty rate in Aceh stood at 14.64%, making it the sixth poorest province in the country, following Papua, West Papua, East Nusa Tenggara, Maluku, and Gorontalo, and positioning it as the poorest province in Sumatra. According to Figure 2, the poverty rate in Aceh has shown a downward trend over the past decade. In 2013, the poverty rate was 17.6%, decreasing by 2.96 percentage points to 14.64% in 2022. However, Aceh's poverty rate has consistently remained above the national average. In terms of the absolute number of impoverished individuals, the decline has been marginal. In 2013, Aceh had 840.71 thousand people living in poverty, which dropped to 806.82 thousand by 2022—a reduction of only 33.89 thousand over ten years. Moreover, the poverty rates across Aceh's districts and municipalities exhibit significant variation, as illustrated in Figure 3. In 2022, while the overall provincial poverty rate was 14.64%, district and municipal poverty rates ranged from 7.13% to 19.18%. These disparities suggest uneven economic development within the province. A lower poverty rate generally reflects improvements in economic development, as noted by Nakabashi

(2018), emphasizing the need for targeted policies to address regional inequalities and accelerate poverty reduction efforts in Aceh.

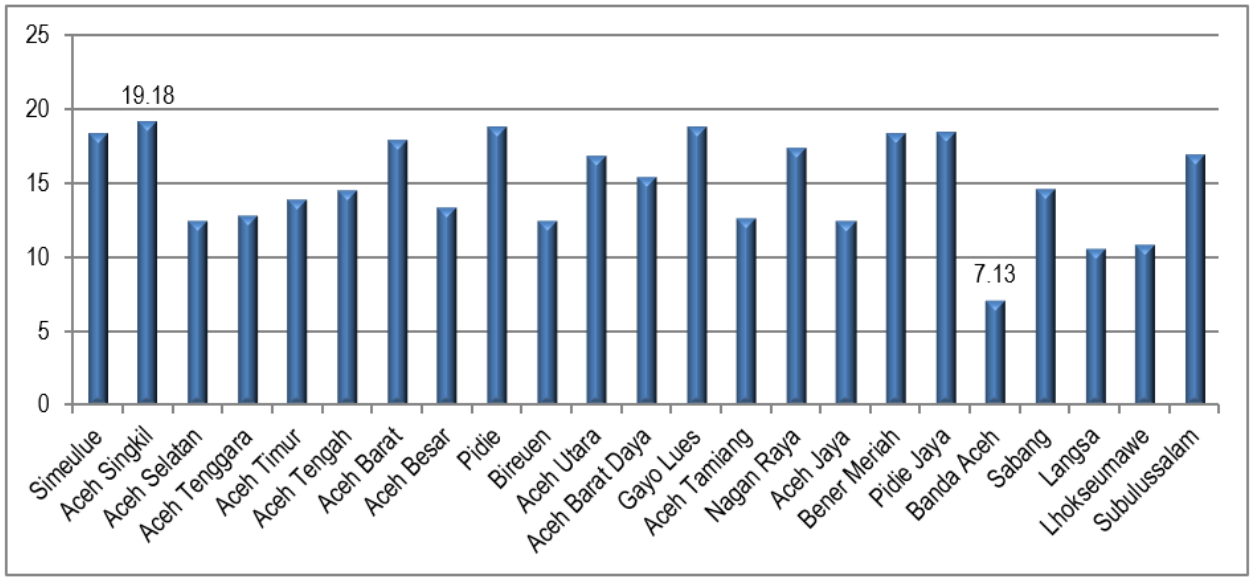

Figure 3. Poverty Levels of Districts/Municipalities in Aceh Province Year 2022

Source: Central Bureau of Statistics (2022)

Banda Aceh recorded the lowest poverty rate among all districts and municipalities in Aceh Province, while Aceh Singkil reported the highest. In addition to Aceh Singkil, ten other municipalities exceeded the provincial poverty rate, including Simeulue, West Aceh, North Aceh, Southwest Aceh, Gayo Lues, Nagan Raya, Bener Meriah, Pidie Jaya, Sabang, and Subulussalam. These disparities highlight the importance of conducting research at the district and city levels to better understand the factors influencing poverty. Numerous empirical studies have previously explored the determinants of poverty, particularly the relationship between the Human Development Index (HDI) and poverty. For instance, research by Hasan (2021), Lestari et al. (2022), Sari (2022), Widiastuti et al. (2022), Hariyanto and Nafi'ah (2023), and Madania and Mubarak (2023) consistently found that HDI, as a measure of human capital, has a negative and significant effect on poverty rates. An increase in HDI reflects improvements in education, healthcare, and per capita income, which collectively facilitate a reduction in poverty. This relationship underscores the role of human capital development in addressing poverty and achieving sustainable economic growth.

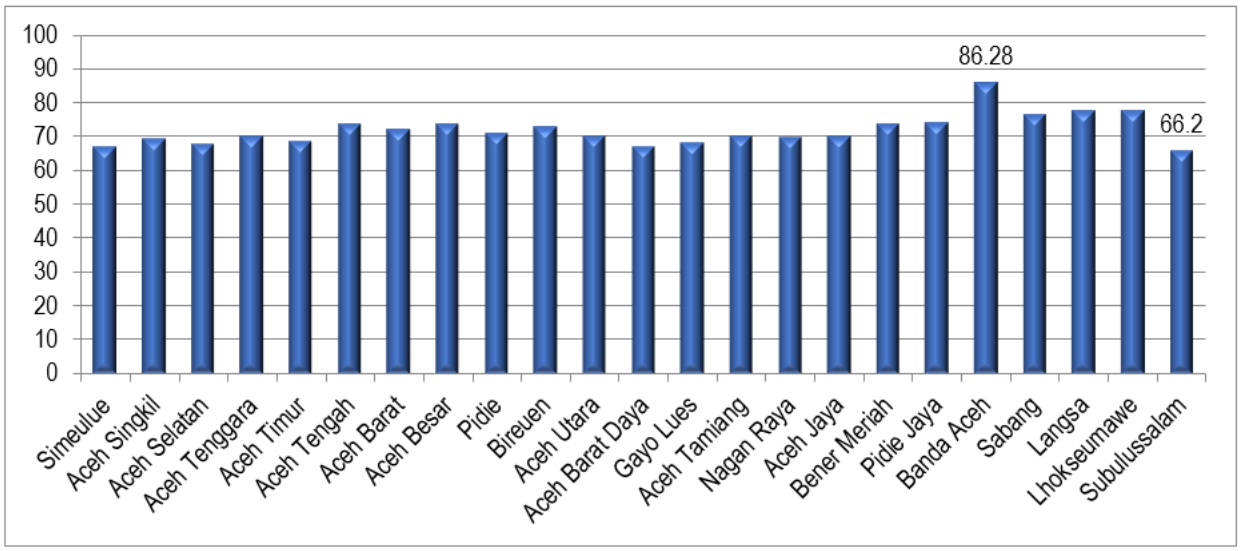

Figure 4. Human Development Index (HDI) of Districts/Municipalities in Aceh Province in 2022

Source: Central Bureau of Statistics (2022)

In 2022, the Human Development Index (HDI) values for most districts and municipalities in Aceh Province were below the national and provincial averages, which stood at 72.91 and 72.80, respectively. Only nine districts and cities

in the province exceeded these averages. Banda Aceh City recorded the highest HDI in Aceh Province, with a value of 86.28, while Subulussalam District had the lowest, with an HDI of 66.2 (Figure 4). Another key variable frequently linked to poverty is labor force participation. Studies by Faridi et al. (2016) and Douidich et al. (2016) indicate that higher labor force participation rates can reduce poverty, including comparisons before and during the COVID-19 pandemic (Muslihatinningsih and Santoso, 2023). Additionally, research by Blank (2018) and Backhaus and Loichinger (2022) highlights that increased female labor force participation significantly contributes to poverty reduction. As Smith (2015) argues, active labor force participation that generates adequate income and resources is essential for individuals to avoid or escape poverty. Figure 5 illustrates that Gayo Lues District had the highest labor force participation rate (LFPR) in Aceh Province, reaching 79.87%, surpassing the national average. This indicates that only 20.13% of individuals aged 15 years and above in Gayo Lues did not participate in the labor market. In contrast, North Aceh District recorded the lowest LFPR in the province, with a rate of 56.37%. These variations underscore the importance of localized strategies to enhance labor force participation as a means to combat poverty.

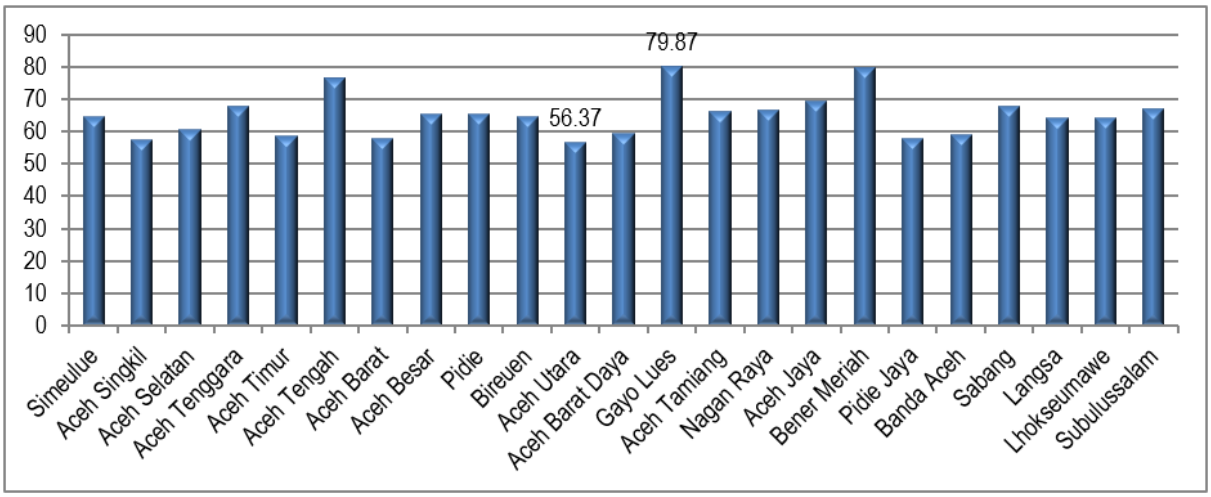

Figure 5. Labor Force Participation Rate (TPAK) of Districts/Municipalities in Aceh Province in 2022
Source: Central Bureau of Statistics **(**2022**)**

Infrastructure spending is frequently linked to poverty reduction. Walinono et al. (2022) observed that higher infrastructure budgets have a significant negative effect on poverty rates, both directly and indirectly, indicating that increased infrastructure investment leads to a decline in poverty levels. Similarly, Zhang et al. (2023) found that infrastructure projects contribute to alleviating local multidimensional poverty and enhancing living standards by fostering local industrialization and improving employment stability. These findings align with studies by Qin et al. (2022) in China and Hartwig and Nguyen (2023) in Southeast Asia, which demonstrate the transformative potential of infrastructure investments in poverty alleviation. Furthermore, Fagbemi et al. (2022) highlight a bidirectional relationship between infrastructure development and poverty over the long term. This suggests that while greater infrastructure investment plays a critical role in reducing poverty, successful poverty alleviation efforts can, in turn, enhance public sector performance. Improved resource allocation resulting from reduced poverty enables the effective and efficient execution of large-scale infrastructure projects. Thus, infrastructure investment not only addresses immediate poverty challenges but also creates a reinforcing cycle that supports long-term development and improved public welfare.

As illustrated in Figure 6, North Aceh District recorded the highest realization of infrastructure expenditure among all districts and cities in Aceh Province, amounting to Rp. 340.82 billion. In contrast, Simeulue Regency had the lowest infrastructure spending, with a total of Rp. 72.63 billion. Aceh Province, governed under sharia law, has unique regulations regarding Zakat, Infaq, and Sadaqah (ZIS) compared to other provinces in Indonesia. According to Law Number 11 of 2006 on the Governance of Aceh and further detailed in Aceh Qanun Number 10 of 2007 on Baitul Mal, all zakat revenues are considered a source of local revenue at the district/city level. These funds are managed by the respective Regency/City Baitul Mal, underscoring the region's distinctive approach to integrating ZIS into its fiscal framework.

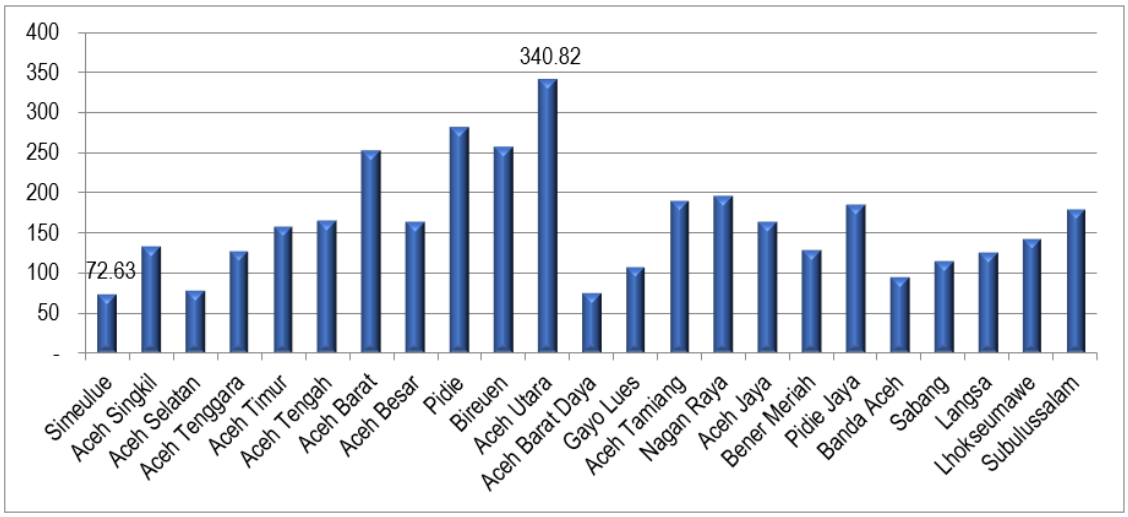

Figure 6. District/Municipality Infrastructure Expenditure in Aceh Province Year 2022 (Billion Rupiah)
Source: Central Bureau of Statistics **(**2022**)**

The Zakat, Infaq, and Sadaqah (ZIS) variable is highly relevant as a moderating factor to examine whether, in Aceh Province—known as the "Serambi Mekkah"—ZIS can amplify or diminish the influence of key variables on poverty rates. This research is particularly compelling due to its novelty and limited prior exploration, with only Madania and Mubarak (2023) utilizing ZIS as a moderating variable in their study on poverty in South Kalimantan Province. Findings from Agniya et al. (2023) indicate that zakat distribution has a negative effect on poverty rates in predominantly Muslim countries, suggesting that increased zakat distribution correlates with reduced poverty levels. This conclusion aligns with the research of Mesawa and Rana (2021), who examined five Islamic countries—Indonesia, Pakistan, Malaysia, Egypt, Algeria, and Sudan—Widiastuti et al. (2022), who studied OIC countries, and Aziz et al. (2020), whose research focused on Pakistan.

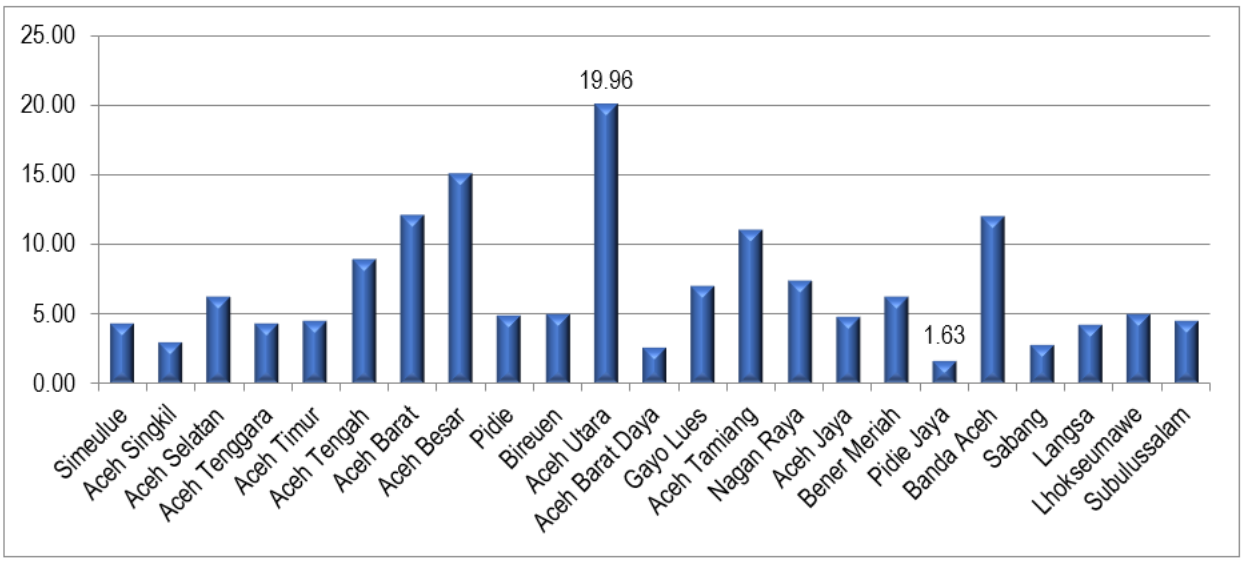

Figure 7. Distribution of Zakat, Infaq and Sadaqah in Districts/Municipalities in Aceh Province in 2022
Source: Baitul Mal Aceh (2022)

As shown in Figure 7, North Aceh Regency reported the highest ZIS distribution among all districts and cities in Aceh Province, with a total value of IDR 19.96 billion in 2022. Conversely, Pidie Jaya Regency recorded the smallest ZIS distribution, amounting to IDR 1.63 billion. These figures highlight significant disparities in ZIS distribution across the region, underscoring its potential role in mitigating poverty when effectively managed.

2. Literature Review

Chambers (2006) defines poverty as a condition characterized by a lack of money and goods necessary for survival. More broadly, poverty is an integrated concept comprising five dimensions: economic deprivation,

powerlessness, vulnerability to crises, dependency, and social or geographical isolation. Poverty is not solely the result of insufficient income or productive resources to secure a sustainable livelihood. It manifests through hunger and malnutrition, limited access to education and basic services, social exclusion, discrimination, and a lack of participation in decision-making processes (UN, 2023). According to human capital theory, an individual's education level directly influences their productivity, which in turn leads to higher earnings (Mincer, 1958; Schultz, 1961; Becker, 1962). Marshal (1920) further emphasized that the most valuable form of capital is that invested in people. Human capital theory rests on three key assumptions: individuals pursue education in their self-interest, as it generates higher economic returns, which form the foundation for their aspirations and social mobility; education is inherently efficient, as employers seek skilled workers; and employers invest in new technologies to capitalize on the enhanced productivity of a more educated workforce (Lauder, 2015). In essence, human capital theory posits that individuals invest in education and training with the expectation of higher future earnings (Tan, 2014).

The Labor Force Participation Rate (TPAK), as defined by the Central Bureau of Statistics, represents the percentage of the population aged 15 and over that is economically active. The TPAK reflects the proportion of working-age individuals engaged in the labor market within a country or region. Changes in TPAK are influenced by factors such as school enrollment rates among young people, which can lower TPAK (Krueger, 2017; Perez-Arce & Prados, 2021), and gender disparities, particularly in developing countries, where societal expectations of women as primary caregivers can limit their participation in the labor force (Andajani et al., 2016; Ulfa et al., 2020; Albanesi & Prados, 2022). Additionally, wage rates play a critical role in labor market dynamics. Classical economic theory asserts that the real wage rate determines labor supply and demand (Kryńska & Kopycińska, 2016). A higher minimum wage may lead to increased labor force participation, though it may also raise the unemployment rate by reducing the availability of jobs (Perez-Arce & Prados, 2021).

The Ministry of Finance (2023) defines infrastructure spending as expenditure directly aimed at accelerating the development of public service facilities and boosting the economy, with the objectives of creating employment opportunities, reducing poverty, and addressing disparities in public services across regions. Infrastructure investment is essential for meeting various basic human needs, both social and economic (Sulistyowati & Wibowo, 2022). Zakat, one of the five pillars of Islam, is obligatory for Muslims whose wealth has reached the minimum threshold (nishab) (Utomo et al., 2020). According to Minister of Religious Affairs Regulation No. 52 of 2014, zakat is a portion of wealth that Muslims or Muslim-owned entities must give to those eligible to receive it, in accordance with Islamic law. Zakat plays a significant role in fostering economic development and addressing social issues (Qasim, 2020). Its primary purpose is to achieve social justice through the redistribution of wealth from the rich to the poor. The Qur'an, in At-Taubah verse 60, specifies eight categories of zakat recipients: the poor, the needy, amil (zakat collectors), converts to Islam, slaves, debtors, those working in the way of Allah (fisabilillah), and travelers in need.

This study focuses on the determination of poverty in Aceh Province, analyzing data from 23 districts and cities across the region. The variables considered include the poor population, Human Development Index (HDI), labor force participation rate, infrastructure spending, and zakat, infak, and sadaqah as moderating variables. The research employs secondary quantitative data, specifically panel data, which combines time series and cross-sectional data. The time series data spans from 2008 to 2022, sourced from the Central Bureau of Statistics, the Ministry of Finance, and Baitul Mal Aceh Province. The study period begins in 2008, as Pidie Jaya Regency and Subulussalam City, which are part of the research area, were established in 2007, and relevant data became available only from 2008 onward. The analysis covers 23 districts/municipalities in Aceh Province over a 15-year period, totaling 345 panel data points. A quantitative methodology is applied, using panel data regression analysis to explore the determinants of poverty in Aceh Province, with zakat serving as a moderating variable.

3. Materials and Methods

Panel data refers to data that has both spatial (individual) and temporal dimensions (Gujarati, 2004). In panel data, the same cross-sectional data is observed across multiple time periods. If a study includes T time periods (t = 1, 2, 3,...T) and N individuals (i = 1, 2, 3,...N), the total number of observations in the panel data is NT. When everyone has the same number of time periods, the panel is considered balanced; however, if individuals have different numbers of time periods, the panel is unbalanced. Panel data addresses the limitations of pure cross-sectional and time-series models by offering more comprehensive analysis. According to Baltagi (2013), the advantages of panel data include: (1) the ability to control for individual heterogeneity, as it allows for the inclusion of individual-specific elements during estimation; (2) providing a larger and more diverse dataset, which helps reduce multicollinearity between variables, increases degrees of freedom, and enhances efficiency; (3) being particularly effective for research involving dynamic adjustments, as repeated cross-sectional observations capture dynamic changes; (4) enabling the identification and measurement of effects in a way that cross-sectional or time-series data alone cannot; and (5) facilitating the testing of more complex models compared to pure cross-sectional or time-series data.

However, panel data also has some limitations, including: (1) issues related to panel survey design, data collection, and management, such as coverage, nonresponse, respondent recall, interview frequency, and timing; (2) potential distortion due to measurement errors, which often arise from inaccurate responses; (3) selectivity concerns, including self-selection, nonresponse, and attrition; (4) short time series, as micro panels typically have limited annual data for each individual; and (5) cross-sectional dependence, where macro panels involving country or region-level analysis may ignore cross-country dependencies, leading to misleading conclusions. In this study, panel data regression analysis is employed to assess the impact of variables such as the Human Development Index (HDI), labor force participation rate (TPAK), infrastructure spending (BI), and the moderating variables of zakat, infaq, and sadaqah (ZIS) on the level of poverty (TK). The general equation for the panel data regression model is expressed as follows (Baltagi, 2013):

$$Y_{it} = \beta_{0it} + \beta_1 X_{1it} + \ldots + \beta_k X_{kit} + \varepsilon_{it}, \quad (1)$$

Where, Y_{it}: value of the dependent variable for the i-th cross-sectional unit in the t-th time series unit, i=1,2,3,...,N and t=1,2,3,...,T; β0it : intercept parameter; βk : parameter for the kth independent variable; Xkit: the value of the kth independent variable for the i-th cross sectional unit in the t-th time series unit; εit : error in the observation of the i-th cross sectional unit in the t-th time series unit. The transformed model equation in this study based on the study of the basic equation of the panel data regression model (Baltagi, 2013) is as follows:

$$POV_{it} = \beta_0 + \beta_{11} IPM_{it} + \beta_{12} TPAK_{it} + \beta_{13} LOGBI_{it} + \varepsilon_{1it}, \quad (2)$$

In this model, POV represents the poor population, HDI denotes the Human Development Index, TPAK stands for labor force participation rate, and LOGBI is the logarithmic transformation of infrastructure spending. The transformation into logarithms is applied due to the varying units of measurement across the variables, such as percentages, values, and points, which could otherwise result in significant disparities in the values and potentially affect the estimation results. β0 represents the constant, while β11, β12, and β13 are the regression coefficients, and ε is the error term. The subscript "i" indicates the individual subject, and "t" refers to the year. There are three types of panel data models: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM) (Sulistianingsih et al., 2016).

1. Common Effect Model (CEM) - The CEM assumes that there are no differences in sector or time effects, meaning that a single model is applied to all observations. The estimation technique used for the CEM is Ordinary Least Squares (OLS).
2. Fixed Effect Model (FEM) - The FEM is used when β is treated as a fixed parameter, but it varies across individuals (i = 1, 2, ..., N). FEM is appropriate when individual and time effects are correlated or exhibit a non-random pattern. This assumption allows for the error components of individual and time effects to be incorporated into the intercept. FEM is typically applied when the number of individuals (N) is small, and the number of time periods (T) is large.
3. Random Effect Model (REM) - The REM treats β as a random parameter and is used when individual and time effects are uncorrelated or follow a random pattern. In this case, the error component of individual and time effects is incorporated into the error term. REM is generally employed when the dataset has a relatively large N and a small T.

3.1. Panel Data Regression

The selection of an appropriate panel data model is essential to determine the most suitable model for a study. Several tests are employed to assist in this decision:

a. Chow Test - The Chow test is used to assess whether the Common Effect Model (CEM) or the Fixed Effect Model (FEM) is more appropriate for estimating panel data. If the null hypothesis (H0) is accepted, the CEM is considered the appropriate model. Conversely, if the alternative hypothesis (H1) is accepted, the FEM model is deemed more suitable.
b. Hausman Test - The Hausman test is conducted to determine whether the Fixed Effect Model (FEM) or the Random Effect Model (REM) is more appropriate for statistical testing. If the null hypothesis (H0) is accepted, the REM is preferred. However, if the alternative hypothesis (H1) is accepted, the FEM model is considered the better choice.
c. Lagrange Multiplier Test - The Lagrange Multiplier (LM) test is employed to evaluate whether the Random Effect Model (REM) is superior to the Common Effect Model (CEM) for processing research data. If the

null hypothesis (H0) is accepted, the CEM is deemed more appropriate. If the alternative hypothesis (H1) is accepted, the REM model is considered the better option.

3.2. Moderated Regression Analysis

Moderating variables are variables that influence the strength or direction of the relationship between independent and dependent variables (Fadillah, 2018). There are three methods commonly used to test moderating variables:

1. Interaction Test - Also known as Moderated Regression Analysis (MRA), this approach is a specific application of linear multiple regression in which the regression equation includes an interaction term, representing the product of two or more independent variables.
2. Absolute Difference Value Test - This method tests the effect of moderation by calculating the absolute difference between the independent variables.
3. Residual Test - Both the interaction test and the absolute difference value test may lead to high multicollinearity between the independent variables, which violates the classical assumptions of ordinary least squares (OLS) regression. To address this issue, the residual test method is used.

Moderated Regression Analysis helps identify the presence and type of moderating variables, and it determines whether these variables strengthen or weaken the relationship between the independent and dependent variables. For example, the interaction term between the Human Development Index (HDI) and the logarithm of zakat, infaq, and Sadaqah (LOGZIS) represents the moderation of zakat, infaq, and Sadaqah on the relationship between HDI and poverty (POV). Similarly, the interaction term between the labor force participation rate (TPAK) and LOGZIS describes the moderation of zakat, infaq, and Sadaqah on the effect of labor force participation on poverty. Likewise, the interaction term between the logarithm of infrastructure spending (LOGBI) and LOGZIS indicates how zakat, infaq, and Sadaqah moderate the relationship between infrastructure spending and poverty. The regression equation used in this test is as follows:

$$POV_{it} = \beta_0 + \beta_{21}IPM_{it} + \beta_{22}TPAK_{it} + \beta_{23}LOGBI_{it} + \beta_{24}IPM*LOGZIS_{it} + \ldots + \beta_{25}TPAK*LOGZIS_{it} + \beta_{26}LOGBI*LOGZIS_{it} + \varepsilon_{2it}, \quad (3)$$

In this equation, POV represents the poor population, β0 is the constant, and β21, β22, β23, β24, β25, and β26 are the regression coefficients. HDI denotes the Human Development Index, TPAK refers to the labor force participation rate, LOGBI is the logarithm of infrastructure spending, and LOGZIS is the logarithm of zakat, infaq, and Sadaqah. The transformation of the data into logarithms is necessary due to the differing units of measurement across variables, such as percentages, absolute figures, and points, which could otherwise distort the estimation results due to large discrepancies in the values of the variables. The interaction terms HDIit * LOGZIS, TPAKit * LOGZIS, and LOGBIit * LOGZIS represent the interaction between the independent variables and zakat, infaq, and Sadaqah as the moderating variable. The error term is denoted by ε, with "i" indicating the i-th subject and "t" representing the t-th year.

3.3. Classical Assumptions

This test is conducted to assess whether the model under investigation deviates from classical assumptions. The regression model derived from the Ordinary Least Squares (OLS) method is considered the Best Linear Unbiased Estimator (BLUE), provided certain classical assumptions are met. These assumptions must be checked for potential deviations through the following steps:

1. Normality Test: This test evaluates whether the residuals of the regression model are normally distributed. A well-fitting regression model should have residuals that follow a normal distribution. It is crucial to note that the normality test should be applied to the residuals, not to each variable in the model. While testing the normality of individual variables is possible, it is not necessary for the model; rather, the focus is on the residuals (often tested using a histogram).
2. Heteroscedasticity Test: To ensure that the regression model provides BLUE estimators, the variance of the residuals (UI) should remain constant across observations (homoscedasticity). If the variance changes, this indicates heteroscedasticity, which undermines the efficiency of regression coefficient estimations. Testing for heteroscedasticity can be done using the White Test, which involves regressing the squared residuals (μi^2) on the independent variables, squared independent variables, and their interactions. In panel data regression using the Random Effect Model (REM), a heteroscedasticity test is unnecessary, as the model employs Generalized Least Squares (GLS), which mitigates heteroscedasticity.
3. Autocorrelation Test: A regression model is deemed usable if there is no autocorrelation, which refers to the correlation between past and current errors or the relationship between observations of a variable. Autocorrelation can affect the efficiency of the estimator. Testing for autocorrelation can be done using the

Durbin-Watson statistic. To address autocorrelation, one option is to include the lag of the dependent variable in the regression model (Gujarati, 2004). In panel data, however, autocorrelation is often not a concern, as suggested by Born and Jorg (2016), who note that in large datasets, the impact on efficiency is generally less significant.

4. Multicollinearity: Multicollinearity refers to a strong linear relationship among independent variables. In a regression model, it is assumed that there should be no such relationship. Testing for multicollinearity can be done by comparing the partial determination coefficient (r^2) with the overall determination coefficient (R^2); if there is no substantial difference, multicollinearity is not an issue (Gujarati, 2003).

3.4. Hypothesis Testing

The statistical hypotheses tested in this study using the t-test are as follows:
Hypothesis I (H1):
H_{110} : $\beta_{11} \geq 0$ Human development index does not negatively affect poverty in Aceh Province.
H_{11a} : $\beta_{11} < 0$ Human development index negatively affects poverty in Aceh Province.
H_{120} : $\beta_{12} \geq 0$ Labor force participation does not negatively affect poverty in Aceh Province.
H_{12a} : $\beta_{12} < 0$ Labor force participation has a negative effect on poverty in Aceh Province.
H_{130} : $\beta_{13} \geq 0$ Infrastructure spending has no negative effect on poverty in Aceh Province.
H_{13a} : $\beta_{13} < 0$ Infrastructure spending has a negative effect on poverty in Aceh Province.

Hypothesis II (H2):
H_{210} : $\beta_{24} = 0$ ZIS does not moderate the effect of the human development index on poverty in Aceh Province.
H_{21a} : $\beta_{24} \neq 0$ ZIS moderates the effect of the human development index on poverty in Aceh Province.
H_{220} : $\beta_{25} = 0$ ZIS does not moderate the effect of labour force participation on poverty in Aceh Province.
H_{22a} : $\beta_{25} \neq 0$ ZIS moderates the effect of labour force participation on poverty in Aceh Province.
H_{230} : $\beta_{26} = 0$ ZIS does not moderate the effect of infrastructure spending on poverty in Aceh Province.
H_{23a} : $\beta_{26} \neq 0$ ZIS moderates the effect of infrastructure spending on poverty in Aceh Province.

4. Results

The results encompass the selection of the most appropriate panel data regression model, the testing of classical assumptions, panel data regression analysis, moderated regression analysis (MRA), and a comprehensive discussion of the findings.

4.1. Panel Data Model Selection

There are two stages of testing for the selection of the best model to be used in this study, including the Chow Test and Hausman Test, for the first regression model.

Table 1. Result of Model Selection for 1st Model

	Effects Test	Statistic	d.f	Prob.
Uji Chow	Cross-section F	1144.6731	(22,319)	0,000
	Cross-section Chi-square	1511.5532	22	0,000
Uji Hausman	Cross-section random	23.752682	3	0.000

The Chow test is performed to determine the most suitable model between the common effect model (cem) and the fixed effect model (fem) for estimating panel data. According to the results in Table 1, the probability value of the cross-section chi-square is less than the significance level (α) (0.000 < 0.05), leading to the rejection of the null hypothesis (H0). This indicates that the fixed effect model (FEM) is preferred over the common effect model (CEM). The subsequent test, the Hausman test, is conducted to identify the more appropriate model between the fixed effect model and the random effect model for estimating panel data. As shown in Table 4.2, the probability value for the Cross-section random is smaller than the significance level (α) (0.000 < 0.05), resulting in the rejection of H0 and confirming that the fixed effect model is more suitable than the random effect model. The second model employed is the Moderated Regression Analysis.

Table 2. Result of Model Selection for 2nd Model

	Effects Test	Statistic	d.f	Prob.
Uji Chow	Cross-section F	1206.5845	(22,315)	0,000

	Effects Test	Statistic	d.f	Prob.
	Cross-section Chi-square	1533.8064	22	0,000
Uji Hausman	Cross-section random	31.044575	7	0.000

On the basis of the results presented in Table 2, the chow test indicates that the fixed effect model is more suitable for estimating panel data. This is evidenced by the probability value of the cross-section chi-square, which is less than the significance level (α) of 0.05 (0.000 < 0.05), leading to the rejection of the null hypothesis (H0). Therefore, it can be concluded that the fixed effect model is preferable to the common effect model. Additionally, the Hausman test suggests that the fixed effect model is more appropriate than the random effect model. The probability value for the random cross-section is smaller than the significance level (α) (0.000 < 0.05), leading to the rejection of H0, thereby confirming that the fixed effect model is the more suitable choice compared to the random effect model.

4.2. Classical Assumptions

The next stage in calculating this study model is determining the optimal latency. Lag is used to quantify the amount of time it takes for an influence to generate an IPM reaction. The best lag for the model may be determined using the Schrawrtz-Bayesian Criteria (SBC), Akaike Information Criteria (AIC), or other criteria information with the lowest criterion information value. In this study, to ensure that the parameter coefficient estimation results have the Best Linear Unbiased Estimator (BLUE) properties, classical assumption testing was carried out. This study uses more than 100 data, namely 345 data, so it can be said that all data is normally distributed, in accordance with the assumptions of the Central Limit Theorem. The theory states that if the number of observations is more than 100 data, the normality test does not need to be done (Gujarati & Porter, 2009: Hernandez, 2021). In addition, the autocorrelation assumption only occurs in time series data. Testing autocorrelation on data that does not use time series, while using cross section or panel data, will be useless or meaningless (Basuki & Prawoto, 2015). So that the classic assumption testing carried out in this study is only the assumptions of multicollinearity and heteroscedasticity. The testing for multicollinearity and heteroscedasticity was conducted with utmost thoroughness, involving 2 (two) tests. The first test examined multicollinearity and heteroscedasticity in the first regression, considering the variables of poor population (POV), Human Development Index (HDI), labor force participation rate (TPAK), and infrastructure spending (LOGBI). The second test was equally comprehensive, covering the variables of poor population (POV), Human Development Index (HDI), labor force participation rate (TPAK), infrastructure spending (LOGBI), zakat, infaq, and **Sadaqah** (LOGZIS), the interaction of HDI and ZIS (HDI_LOGZIS), the interaction of labor force participation rate with ZIS (TPAK_LOGZIS), and the interaction of infrastructure spending with ZIS (LOGBI_LOGZIS).

4.2.1. Heteroscedasticity

The results of the heteroscedasticity test in regression model 1 shown in Table 3 explain that 2 variables have symptoms of heteroscedasticity, namely the Human Development Index (HDI) and infrastructure spending variables with alpha (α) values (prob < 0.05), while the labor force participation rate variable is not statistically significant to the absolute residual. This is evidenced by the probability value that is greater than alpha (α) (prob > 0.05). so it can be concluded that the model has symptoms of heteroscedasticity. According to Melati Suryowati (2018), in data that has heteroscedasticity symptoms during regression, to overcome these heteroscedasticity symptoms, the regression model used is random effect with the Generalized Least Square (GLS) estimation method.

Table 3. Result of Heteroscedasticity for 2nd Model

Variable(s)	Coefficient(s)	Std. Error	t-statistic	Prob.
IPM	0.19011	0.038684	4.914456	0.0000
TPAK	-0.000427	0.023599	-0.018098	0.9856
LBI	-0.449385	0.142461	-3.154434	0.0018
C	0.108698	4.077178	0.02666	0.9787

The results of the heteroscedasticity test on the second regression model shown in Table 4 explain that none of the independent variables are statistically significant to the absolute residual. This is evidenced by the probability value which is greater than alpha (α) (prob> 0.05). So, it can be concluded that the model is free from symptoms of heteroscedasticity.

Table 4. Result of Heteroscedasticity for 2nd Model

Variable(s)	Coefficient(s)	Std. Error	t-statistic	Prob.
IPM	0.471663	0.537565	0.877406	0.3809
TPAK	-0.677108	0.430568	-1.572592	0.1168
LOGBI	3.72247	2.821067	1.319525	0.188
LOGZIS	2.442008	3.619128	0.67475	0.5003
IPM_LOGZIS	-0.015844	0.024369	-0.650154	0.5161
TPAK_LOGZIS	0.031011	0.019311	1.605827	0.1093
LOGBI_LOGZIS	-0.157196	0.127457	-1.23332	0.2184
C	-67.58256	80.57101	-0.838795	0.4022

4.2.2. Multicollinearity

Multicollinearity occurs because of the linear relationship between independent variables. One way to determine the presence of multicollinearity symptoms is to test the correlation between independent variables. If the correlation value between the independent variables is smaller than 0.900, then there is certainly no multicollinearity, and vice versa. Based on Table 5, the correlation values obtained are all below the value of 0.900, which means that the Human Development Index, labor force participation rate and infrastructure spending variables are free from multicollinearity problems. The analysis can proceed since there are no classical assumption deviations in either the data or the model.

Table 5. Result of Heteroscedasticity for 1st Model

Variable(s)	IPM	TPAK	LBI
IPM	1.000000		
TPAK	-0.024709	1.000000	
LBI	0.058582	0.097892	1.000000

Likewise, with the second Multicollinearity test, if the correlation value between the independent variables is smaller than 0.900, then it is certain that there is no multicollinearity, and vice versa. Based on Table 6, the correlation value obtained is mostly below the value of 0.900, only the correlation of the HDI variable with the LOGZIS * HDI interaction variable, the TPAK variable with the LOGZIS * TPAK interaction, and the LOGZIS variable with the LOGZIS * LOGGBI interaction variable have a correlation value above 0.9, which means multicollinearity occurs.

Table 6. Result of Heteroscedasticity for 2nd Model

	IPM	TPAK	LOGBI	LOGZIS	IPM*LOGZIS	TPAK*LOGZIS	LOGBI*LOGZIS
IPM	1.00000						
TPAK	-0.02471	1.00000					
LOGBI	0.05858	0.09789	1.00000				
LOGZIS	0.42170	0.14844	0.50728	1.00000			
LOGZIS*IPM	0.92527	0.04153	0.25249	0.73307	1.00000		
LOGZIS*TPAK	0.12514	0.93990	0.26105	0.47591	0.29054	1.00000	
LOGZIS*LOGBI	0.31734	0.14541	0.80555	0.91899	0.61969	0.44525	1.00000

4.3. Hypothesis Testing

The first regression model uses panel data regression with a random effect model. This regression was conducted to see the effect of human development index, labor force participation rate and infrastructure spending variables partially and simultaneously on poverty in Aceh Province. The Prob (F-Statistics) value listed in Table 7 shows at the one % significance level, which explains that simultaneously the independent variables affect the dependent variable and can be proven statistically. Clarified by the Adjusted R-Squares value of 0.988 which shows that 98.8 % of the poor population variable is influenced and can be explained by the three independent variables in this study, namely the human development index variable, the labor force participation rate and infrastructure spending, while the other 0.2 % is influenced by other variables that are not included in the model.

Table 7. Result of Panel Data Regression for 1st Model

Variables	Coefficient(s)	Std. Error	t-statistic	Prob.
IPM	-0.0626	0.0701	-0.8917	0.3732

TPAK	-0.0561	0.0429	-1.3093	0.1913
LOGBI	-1.1054***	0.2591	-4.2661	0.0000
C	73.768***	8.4190	8.7620	0.0000
R-squared	0.0690		F-statistic	8.4218***
Adjusted R-squared	0.0608		Prob(F-statistic)	0.000

Note: *,** and *** is significant at the level 10, 5 and 1 percent.

The first hypothesis of this study posits that the human development index (HDI) has a significant negative impact on the number of people living in poverty in Aceh Province. Panel regression analysis was employed to test this hypothesis, with the results presented in Table 7. The HDI variable shows a probability value of 0.403, which is greater than 0.05, and a negative coefficient, indicating that the null hypothesis (H0) cannot be rejected. Therefore, it can be concluded that the human development index does not have a significant effect on poverty in Aceh Province. The second hypothesis asserts that the Labor Force Participation Rate (TPAK) negatively influences the poverty rate in Aceh Province. The TPAK variable yielded a probability value of 0.223, which is greater than 0.05, suggesting the acceptance of H0. This implies that the labor force participation rate does not significantly affect the poverty population in Aceh Province. The third hypothesis proposes that infrastructure spending negatively affects the poverty rate in Aceh Province. The T-test results indicate that the infrastructure spending variable has a probability value of 0.000, which is less than 0.05, leading to the rejection of H0. Consequently, it can be concluded that infrastructure spending does have a negative effect on the poverty rate in Aceh Province.

Moderated Regression Analysis (MRA) is conducted to assess whether moderating variables can either strengthen or weaken the effect of independent variables on the dependent variable. In this study, zakat, infaq, and Sadaqah (ZIS) serve as the moderating variable, while the human development index (HDI), labor force participation rate (TPAK), and infrastructure spending (BI) are the independent variables, and the poverty rate (TK) is the dependent variable. MRA is performed on the second regression model using panel data analysis with the random effect model. According to Table 8, the probability value for the interaction term HDI*LOGZIS is -0.135 with a probability of 0.004, which is less than 0.05. This indicates that the interaction between the human development index and zakat, infaq, and alms (ZIS) significantly affects poverty levels. Thus, it can be concluded that ZIS moderates the relationship between HDI and poverty in Aceh Province. In contrast, for the interaction term TPAK*LOGZIS, the probability value is 0.281, which is greater than 0.05, suggesting that the interaction between the labor force participation rate and zakat, infaq, and Sadaqah does not influence poverty in Aceh. Therefore, ZIS does not moderate the effect of TPAK on poverty in the province. Finally, the interaction term LOGBI*LOGZIS has a coefficient of -0.959 with a probability of 0.000, which is less than 0.05. This result indicates that the interaction between infrastructure spending and zakat, infaq, and Sadaqah has a significant effect on poverty levels in Aceh Province, meaning that ZIS moderates the impact of infrastructure spending on poverty in the region.

Table 8. Result of Panel Data Regression for 2nd Model

Variable(s)	Coefficient(s)	Std. Error	t-statistic	Prob.
IPM	3.0603***	1.0167	3.0098	0.0028
TPAK	-0.8474	0.8143	-1.0405	0.2989
LOGBI	21.1785***	5.3358	3.9691	0.0001
LOGZIS	29.1116***	6.8452	4.2528	0.0000
IPM*LOGZIS	-0.1354***	0.0461	-2.9383	0.0035
TPAK*LOGZIS	0.0394	0.0365	1.0804	0.2808
LOGBI*LOGZIS	-0.9593***	0.2411	-3.9792	0.0001
C	-610.8586***	152.3923	-4.0084	0.0001
R-squared	0.9914		F-statistic	1253.292 ***
Adjusted R-squared	0.9906		Prob(F-statistic)	0,000

Note: *,** and *** is significant at the level 10, 5 and 1 percent.

5. Discussion

The human development index (HDI) has no effect on poverty (POV) in Aceh Province, with a coefficient of -0.059. This means that when the human development index increases by one point, the number of poor people will decrease by 0.059 thousand people. The results of this study are in line with Sinaga's research (2020) which found that the human development index has no effect on poverty in Batu Bara Regency and Medan City. This means that an increase or decrease in the human development index will not affect the increase or decrease in poverty. This is confirmed by the

results of Dahliah and Nur's research (2021) which states that the HDI variable has no effect on poverty in East Luwu. In fact, Hamdani and Asnawi (2023) who conducted research in four provinces on the island of Sumatra, namely Aceh, Bengkulu, South Sumatra and Lampung Provinces from 2007 to 2021 also got the same thing. Azhar (2024), who conducted research in West Java Province, also found that human development could not significantly reduce poverty. The labour force participation rate (TPAK) has no effect on poverty, with a coefficient value of -0.051983. This indicates that everyone per cent increase in labour force participation will reduce the number of poor people in Aceh Province by 0.052 thousand people.

The results of this study are in line with research conducted by Setiawan and Adzim (2017) in 32 provinces in Indonesia which found that the level of labour force participation has no effect on poverty in Indonesia. An increase in labour force participation does not affect the number of poor people in Indonesia because the price of goods increases, so that even though the number of labour force entering the labour market is increasing, because the price of goods is increasing, the income earned will not meet the needs and put workers below the poverty line. This research is also corroborated by Damayanti et al. (2022) and Wiranata and Setyari (2023) who conducted research in North Sumatra Province in 2001-2020 and Bali Province. Infrastructure spending (LOGBI) negatively affects the poverty rate at the one % significance level with a coefficient of -1.13. This indicates that everyone rupiah of logarithmic infrastructure spending will reduce 1.13 thousand poor people in Aceh Province. These empirical results are in line with the research of Walinono et al. (2022) which states that the infrastructure budget has a significant negative effect on the poverty rate both directly and indirectly, which means that the greater the infrastructure budget, the poverty rate will decrease.

Zhang et al. (2023) found that infrastructure projects can continue alleviating local multidimensional poverty, improving living standards through local industrialisation, and increasing individual employment stability. As found by Qin et al. (2022) in China and Hartwig and Nguyen (2023) in Southeast Asia. Even according to Fagbemi et al. (2022), the relationship between infrastructure and poverty is bidirectional in the long run. This means that increased infrastructure investment may be the key to increasing the impact of poverty alleviation. In contrast, poverty alleviation may lead to better performance in the public sector, resulting in efficient and effective resource allocation for large infrastructure development. In addition, using moderate regression analysis, it is known that the interaction of the human development index and zakat, infaq and alms (HDI*LOGZIS) variables affects the poor population in Aceh Province, with a probability value of 0.004 (Table 4.9), and it can be stated that ZIS is able to moderate the effect of HDI on poverty in Aceh Province. This study's results align with research conducted by Cahyo (2023) in Central Java Province in 2018-2021, which found that zakat moderates the effect of the Human Development Index on poverty reduction in Central Java Province.

In contrast to the interaction of the labour force participation rate variable and zakat, infaq and alms (TPAK * LOGZIS), which has no effect on poverty in Aceh Province, with a probability value of 0.281 (Table 4.9), it can be stated that ZIS is not able to moderate the effect of TPAK on poverty in Aceh Province. The results of this study are in line with the research found by Nengsih et al. (2024) in Jambi Province in 2018-2022, which found that zakat was not able to moderate the effect of labour force participation on poverty in Jambi Province. While the interaction of infrastructure spending variables and zakat, infaq and alms (LOGBI*LOGZIS) has a negative effect on poverty in Aceh Province with a probability value of 0.000 (Table 4.9), which means that ZIS can moderate the effect of infrastructure spending on poverty in Aceh Province. This indicates that ZIS can strengthen the influence of infrastructure spending to reduce the number of poor people in Aceh Province.

6. Conclusion

This study aims to analyse the effect of the human development index, labour force participation rate, and infrastructure spending on the poverty rate in Aceh Province by using zakat, infaq, and Sadaqah as moderating variables. It uses panel data from 2008 - 2022 covering 23 districts/municipalities. This study uses a panel data regression model and Moderated Regression Analysis to estimate two regression models at a 99 % confidence level. Based on the results of the study, it was found that the human development index has no effect on poverty, the labour force participation rate has no effect on the poverty rate, infrastructure spending has a negative effect on the poverty rate, zakat, infaq and alms are able to moderate the effect of the human development index and infrastructure spending on the poverty rate in Aceh Province. However, zakat, infaq and Sadaqah are not able to moderate the effect of the labour force participation rate on the poverty rate in Aceh Province.

Author Contributions: Conceptualization, C.S., and M.S.A.M.; methodology, C.S.; software, C.S.; validation, M.S.A.M. and S.S.; formal analysis, C.S.; investigation, C.S. and S.S.; resources, C.S.; data curation, M.S.A.M. and S.S.; writing—original draft preparation, C.S. and S.S.; writing—review and editing, C.S., M.S.A.M. and S.S.; visualization, C.S.; supervision, M.S.A.M. and S.S.; project administration, C.S.; funding acquisition, C.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Acknowledgments: The authors would like to thank the Universitas Syiah Kuala, Indonesia, for supporting this research and publication. The authors would also like to thank the reviewers for their constructive comments and suggestions.

Conflicts of Interest: The authors declare no conflict of interest.

Reference

Agniya, N., Badina, T., & Najib, M. A. (2023). The effect of zakat performance and macroeconomic variables on poverty levels (empirical study in 34 Provinces in Indonesia). 1–14.

Albanesi, S., & Prados, M. J. (2022). Slowing women's labor force participation: The role of income inequality. In w29675.

Andajani, S., Hadiwirawan, O., & Sokang, Y. A. (2016). Women's leaderships in Indonesia: current discussion, barriers, and existing stigma. *Indonesian Feminist, 4*(1), 101–111.

Azhar, A. (2024). Evaluation of the impact of the open unemployment rate and human development index on poverty levels. *Harmony Management: International Journal of Management Science and Business, 1*(1), 1–10.

Aziz, Y., Mansor, F., Waqar, S., & Haji Abdullah, L. (2020). The nexus between zakat and poverty reduction is the effective utilization of zakat necessary for achieving SDGs: A multidimensional poverty index approach. *Asian Social Work and Policy Review, 14*(3), 235–247. https://doi.org/10.1111/aswp.12212

Backhaus, A., & Loichinger, E. (2022). Female labor force participation in Sub-Saharan Africa: A Cohort Analysis. *Population and Development Review, 48*(2), 379–411. https://doi.org/10.1111/padr.12492

Baltagi, Badi H. (2013). *Econometric Analysis of Panel Data*. Fifth Edition. England: John Wiley & Sons

Becker, G. S. (1962). Investment in human beings. *The Journal of Political Economy, 70*(5), 9-49. https://doi.org/10.1086/258724

Blank, R. M. (2018). *It takes a nation: A new agenda for fighting poverty-updated edition*. Princeton University Press.

Cahyo, C. N. (2023). Pengaruh penyerapan tenaga kerja, indeks pembangunan manusia dan pertumbuhan ekonomi terhadap tingkat kemiskinan dengan zakat sebagai variabel moderasi di Provinsi Jawa Tengah tahun 2018-2021.

Chambers, R. (2006). Concepts and measures: What is poverty? International Poverty Centre, Poverty in Focus, 13, 1-12.

Cuthbertson, P. (2018). Poverty and crime: Why a new war on criminals would help the poor most. Civitas, July, 1–19.

Dahliah, D., & Nur, A. N. (2021). The influence of gross domestic product and human development index on CO2 emissions. *Golden Ratio of Social Science and Education, 1*(2), 95–108. https://doi.org/10.1088/1742-6596/1808/1/012034

Decerf, B. (2022). *Absolute and Relative Poverty Measurement*. World Bank Group

Damayanti, D. R., Utami, G. S., & ... (2022). Analysis of the effect of gross regional domestic product, labor force participation rate, and unemployment on poverty in North Sumatra Province in 2001-2020. *Prosiding Seminar*, 1(1), 51–62.

Douidich, M., Ezzrari, A., Van der Weide, R., & Verme, P. (2016). Estimating quarterly poverty rates using labor force surveys: A primer. World Bank Economic Review, 30(3), 475–500. https://doi.org/10.1093/wber/lhv062

Fadillah, H. (2018). Pengaruh tax avoidance terhadap nilai perusahaan dengan kepemilikan institusional sebagai variabel moderasi. *Jurnal Ilmiah Akuntansi Fakultas Ekonomi, 4*(1), 117–133.

Fagbemi, F., Osinubi, T. T., & Adeosun, O. A. (2022). Enhancing sustainable infrastructure development: A boon to poverty reduction in Nigeria. *World Development Sustainability, 1*(August 2021), 100006. https://doi.org/10.1016/j.wds.2022.100006

Faridi, M. Z., Chaudhry, M. O., Farooq, F., & Arif, R. (2016). Labor force participation and poverty alleviation in Pakistan: An empirical analysis. *Pakistan Journal of Social Sciences, 36*(2), 1251–1263.

Firdaus. (2017). Sadaqah dalam perspektif Al-Quran. Ash-Shahabah, 3(1), 93.

Fitriady, A., Silvia, V., & Suriani, S. (2022). Does economic growth mediate investment, inflation, and human development investment on poverty in Indonesia? *Signifikan: Jurnal Ilmu Ekonomi, 11(*2), 437–456. https://doi.org/10.15408/sjie.v11i2.26145

Foster, J., Greer, J., & Thorbecke, E. (1984). A class of decomposable poverty measures. *Econometrica: Journal of the Econometric Society, 52*(3), 761–766.

Gujarati, D. N. (2004). *Basic Econometric*. 4th Edition. New York: Mc Graw Hill.

Hamdani, E., & Asnawi, A. (2023). The effect of human development index (Hdi) gross regional domestic product (GDRP) and unemployment on poverty in 4 Provinces in Sumatra Island. *Journal of Malikussaleh Public Economics, 6*(2), 1. https://doi.org/10.29103/jmpe.v6i2.13752

Hariyanto, & Nafi'ah, B. (2023). Analysis of zakat, infaq, Sadaqah (ZIS), HDI, inflation, and GRDP on poverty alleviation in Indonesia. *Jurnal Ilmiah Ekonomi Islam, 9*(01), 1189–1196. http://dx.doi.org/10.29040/jiei.v9i1.7934

Hartwig, T., & Nguyen, T. T. (2023). Local infrastructure, rural households' resilience capacity and poverty: evidence from panel data for Southeast Asia. *Journal of Economics and Development, 25*(1), 2–21. https://doi.org/10.1108/jed-10-2022-0199

Hasan, Z. (2021). The effect of economic growth and human development index on poverty in Indonesia. *Journal of Economics and Sustainability, 3*(1), 42–53. https://doi.org/10.32890/jes2021.3.1.5

Hernandez, H. (2021). Testing for normality: What is the best method Fors. *Chem Research Reports, 6*(5), 1-38. https://doi.org/10.13140/RG.2.2.13926.14406

Kemenkeu (2023). Belanja infrastruktur. Diakses pada https://djpk.kemenkeu.go.id/?ufaq=apa-saja-yang-termasuk-dalam-kategori-infrastruktur-yang-dimasukkan-dalam-laporan-belanja-infrastruktur-yang-bersumber-dari-transfer-ke-daerah-yang-penggunaannya-bersifat-umum#:~:text=Belanja%20Infrastruktur%20yang%20dimaksud%20merupakan,mengurangi%20kesenjangan%20pelayanan%20publik%20antardaerah.

Kemenko pmk (2023). Percepat Penghapusan Kemiskinan Ekstrem, Pemerintah Evaluasi Program Pemberdayaan Ekonomi dan Peningkatan Produktivitas. Diakses pada https://www.ekon.go.id/publikasi/detail/5332/percepat-penghapusan-kemiskinan-ekstrem-pemerintah-evaluasi-program-pemberdayaan-ekonomi-dan-peningkatan-produktivitas

Krueger, A. B. (2017). Where have all the workers gone? An inquiry into the decline of the U.S. labor force participation rate. *Brookings Papers on Economic Activity, 14*(4), 535–562. https://doi.org/10.1353/eca.2017.0012.Where

Kryńska, E., & Kopycińska, D. (2016). Wages in labour market theories. *Folia Oeconomica Stetinensia, 15*(2), 177–190. https://doi.org/10.1515/foli-2015-0044

Lauder, H. (2015). Human capital theory, the power of transnational companies and a political response in relation to education and economic development. *Compare, 45*(3), 490–493. https://doi.org/10.1080/03057925.2015.1027515

Lestari, E. P., Rahayu, H. C., Retnaningsih, T. K., & Suhartono, S. (2022). Significant role of the human development index in alleviating poverty. *Journal of Social Economics Research, 9*(3), 147–160. https://doi.org/10.18488/35.v9i3.3170

Madania, S., & Mubarak, Z. (2023). Can Economic Growth, HDI, and Zis Contribute to Poverty Reduction in South Kalimantan? *Ecodemica: Jurnal Ekonomi, Manajemen, Dan Bisnis., 7*(1), 16–22.

Marshal, A. (1920). *Principles of economics*. London: Mcmillan.

Melati, P. M., & Suryowati, K. (2018). Aplikasi metode common effect, fixed effect, dan random effect untuk menganalisis faktor-faktor yang mempengaruhi tingkat kemiskinan kabupaten/kota di Jawa Tengah dan Daerah Istimewa Yogyakarta. *Jurnal Statistika Industri Dan Komputasi, 3*(1), 41–51. http://ipm.bps.go.id/

Mesawa, L. A., & Rana, F. (2021). Role of zakat in reducing poverty in Islamic countries. *PalArch's Journal of Archaeology of Egypt/Egyptology, 18*(13), 274–285.

Miah, M. A. (2021). Effectiveness of zakat-based poverty alleviation program: evidence from Bangladesh. *International Journal of Zakat, 6*(2), 27–42. https://www.ijazbaznas.com/index.php/journal/article/view/325

Mincer, J. (1958). Investment in human capital over time. *Journal of Political Economy, LXVI*(4), 281–302. https://doi.org/10.1111/j.1467-9957.1977.tb00688.x

Muhamat, A. A., Jaafar, N., Rosly, H. E., & Manan, H. A. (2013). An appraisal on the business success of entrepreneurial asnaf an empirical study on the state zakat organization (the Selangor Zakat Board or Lembaga Zakat Selangor) in Malaysia. *The Eletronic Library, 11*(1), 51–63.

Munandar, E., Amirullah, M., & Nurochani, N. (2020). Pengaruh penyaluran dana Zakat, infaq dan Sadaqah (ZIS) dan pertumbuhan ekonomi terhadap tingkat kemiskinan. *Jurnal Akuntasi Dan Keuangan Islam, 1*(1), 25–38.

Muslihatinningsih, F., & Santoso, E. (2023). *Poverty Dynamics in Indonesia (A Comparison Of Condition Prior To And During The Covid-19 Pandemic)*. The 4th International Conference on Economics, Business and Information Technology 305–313.

Nakabashi, L. (2018). Poverty and economic development: Evidence for the Brazilian states. *EconomiA, 19*(3), 445–458. https://doi.org/10.1016/j.econ.2018.11.002

Nengsih, T. A., Andriani, B. F., & Sugiharto, J. (2024). Pengaruh PDRB, TPAK, IPM terhadap tingkat kemiskinan melalui zakat sebagai variabel moderasi di Provinsi Jambi tahun 2018-2022. *Arzusin, 4*(1), 264–290. https://doi.org/10.58578/arzusin.v4i1.2647

Nguyen, K. H., & Kakinaka, M. (2019). Renewable energy consumption, carbon emissions, and development stages: Some evidence from panel cointegration analysis. *Renewable Energy, 132*, 1049–1057. https://doi.org/10.1016/j.renene.2018.08.069

Othman, A., Hasan, Z. A., Ibrahim, K., Nurul, S., & Ibrahim, H. (2024). Factors influencing the intention to donate (infaq and Sadaqah) among UiTMCM staff. *Global Business and Management Research: An International Journal 16*(2), 279–296.

Peraturan Menteri Agama No 52 Tahun 2014 Tentang Syarat dan Tata Cara Penghitungan Zakat Mal dan zakat Fitrah Serta Pendayagunaan Zakat untuk Usaha Produktif

Perez-Arce, F., & Prados, M. J. (2021). The decline in the U.S. labor force participation rate: A literature review. *Journal of Economic Surveys, 35*(2), 615–652. https://doi.org/10.1111/joes.12402

Price, J. H., Khubchandani, J., & Webb, F. J. (2018). Poverty and health disparities: What can public health professionals do? *Health Promotion Practice, 19*(2), 170–174. https://doi.org/10.1177/1524839918755143

Pulungan, Z. G., Harmain, H., & Syafina, L. (2023). Pengaruh zakat, pembiayaan syariah, sukuk, terhadap kemiskinan dengan pertumbuhan ekonomi nasional sebagai variabel moderasi di Indonesia. *JEBD: Jurnal Ekonomi Dan Bisnis Digital, 1*(2), 589–595.

Qamariyah, L., Olga Mardianita W.P, & Ph.D, S. R. (2022). Pengaruh IPM, investasi, dan UMP terhadap tingkat pengangguran terbuka di Jawa Timur tahun 2013-2020. *OECONOMICUS Journal of Economics, 7*(1), 1–15.

Qanun Aceh Nomor 10 Tahun 2007 tentang Baitul Mal

Qasim, M. I. (2020). The role of zakat in poverty alleviation in Nigerian society. International Journal of Zakat and Islamic *Philanthropy, 2*(1), 192–200.

Qin, X., Wu, H., & Shan, T. (2022). Rural infrastructure and poverty in China. *PLoS ONE, 17*(6 June), 1–19. https://doi.org/10.1371/journal.pone.0266528

Rahmani, A. R. (2021). Pengaruh gender ratio, dependency ratio, dan tingkat partisipasi angkatan kerja perempuan terhadap kemiskinan di Provinsi Nusa Tenggara Barat tahun 2010-2017. *Jurnal Ilmiah Universitas Brawijaya, 1*(1), 1–11.

Ray, D., & Ing, L. Y. (2016). Addressing Indonesia's infrastructure deficit. *Bulletin of Indonesian Economic Studies, 52*(1), 1–25. https://doi.org/10.1080/00074918.2016.1162266

Rini, R., & Fatimah, F. (2019). *Zakat and poverty: An Indonesia experience*. International Conference on Accounting and Management Faculty, 128.

Sahla, H., Harahap, I., Nawawi, Z. M., & Asahan, U. (2024). Analisa kemiskinan dan distribusi pendapatan dalam teori ekonomi. *Journal of Science*, 4307(1), 173–180.

Sari, N. P. (2022). Analisis faktor yang mempengaruhi IPM dan kemiskinan di Indonesia tahun 2021. T*he Indonesian Journal of Social Studies, 6*(2), 68–78. https://journal.unesa.ac.id/index.php/jpips/article/view/8508/4156

Schultz, T. W. (1961). Investment in human capital. *The American Economic Review, 51*(1), 1–17.

Setiawan, A. B., & Adzim, F. (2017). Determinant of poverty in Indonesia. *Economics Development Analysis Journal, 6*(1), 22–29. https://doi.org/10.15294/edaj.v6i1.22197

Sinaga, M. (2020). Analysis of effect of GRDP (gross regional domestic product) per capita, inequality distribution income, unemployment and HDI (human development index) on poverty. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences, 3*(3), 2309–2317. https://doi.org/10.33258/birci.v3i3.1177

Smith, L. (2015). Reforming the minimum wage: Toward a psychological perspective. *American Psychologist, 70*(6), 557–565. https://doi.org/10.1037/a0039579

Sulistianingsih, E., Kiftiah, M., Rosadi, D., & Wahyuni, H. (2016). Preface: International conference on recent trends in physics (ICRTP 2016). *Journal of Physics: Conference Series, 755*(1). https://doi.org/10.1088/1742-6596/755/1/011001

Sulistyowati, D., & Wibowo, P. (2022). Infrastructure spending in the characteristics of the regions: Towards the achievement of sustainable development goals. *The Indonesian Journal of Accounting Research, 25*(03), 319–358. https://doi.org/10.33312/ijar.622

Tamimi, K., & Syarbaini, A. M. B. (2023). Analisis interaksi dan kontribusi zakat, infaq, Sadaqah (ZIS) dan Islamic human development index (I-HDI) terhadap kemiskinan di Indonesia. *Inovasi: Jurnal EKonomi, Keuangan Dan Manajemen, 19*(3), 678–688.

Tan, E. (2014). Human capital theory: A holistic criticism. *Review of Educational Research, 84(*3), 411–445. https://doi.org/10.3102/0034654314532696

Ulfa, M., Jamal, A., & Majid, M. S. A. (2020). Portrait of gender economic inequality in Indonesia. *East African Scholars Journal of Economics, Business and Management April, 3*(1), 79-85 https://doi.org/10.36349/EASJEBM.2020.v03i01.10

Undang-Undang Nomor 11 Tahun 2006 tentang Pemerintahan Aceh

Undang-Undang Nomor 23 Tahun 2011 tentang Pengelolaan zakat

Undang-Undang Nomor 20 Tahun 2019 tentang Anggaran Pendapatan dan Belanja Negara Tahun Anggaran 2020

United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. General Assembley 70 session.

United Nations (2023). Global issues: Ending poverty. diakses dari https://www.un.org/en/global-issues/ending-poverty (diakses pada 8 September 2023)

Utomo, I. C., Rokhmah, S., Muqorobin, M., & Muslihah, I. (2020). Web based distribution of zakat, infaq, and shodaqoh (case study ff Surakarta City Region). *International Journal of Computer and Information System, 1*(1), 16–21. https://doi.org/10.29040/ijcis.v1i1.4

Verick, S. (2018). Female labor force participation and development. IZA World of Labor, December 1–11. https://doi.org/10.15185/izawol.87.v2

Walinono, A. M. I., Arifuddin, Nohong, M., Munizu, M., & Dwiyanti, A. A. R. (2022). Analysis of determinants of poverty rates in Indonesia. *Journal of Positive School Psychology, 2022*(6), 8581–8595. http://journalppw.com

Wicaksono, J. W. (2019). Distribusi zakat produktif untuk pengembangan ekonomi. *Dinar: Jurnal Prodi Ekonomi Syari'ah, 2*(2), 1–20.

Widiastuti, T., Mawardi, I., Zulaikha, S., Herianingrum, S., Robani, A., Al Mustofa, M. U., & Atiya, N. (2022). The nexus between Islamic social finance, quality of human resource, governance, and poverty. *Heliyon, 8*(12), e11885. https://doi.org/10.1016/j.heliyon.2022.e11885

Wiranata, A. A. N., & Setyari, N. P. W. (2023). Variables that impact the poverty in regencies/cities of Bali province. *International Journal of Scholarly Research in Multidisciplinary Studies, 2*(2), 001–007. https://doi.org/10.56781/ijsrms.2023.2.2.0050

World Bank (2023). Poverty. diakses dari https://www.worldbank.org/ en/topic/poverty/overview

Wulandari, N., Agussalim, & Fitriani, R. (2022). Pengaruh investasi dan tenaga kerja terhadap kemiskinan di Sulawesi Selatan. *Development Policy and Management Review, 2*(1), 1–23. https://journal.unhas.ac.id/index.php/DPMR/

Yakunina, R. P., & Bychkov, G. A. (2015). Correlation analysis of the components of the human development index across countries. *Procedia Economics and Finance, 24*(July), 766–771. https://doi.org/10.1016/s2212-5671(15)00692-9

Zaenuddin, M. (2018). *Isu, Problematika, dan Dinamika Perekonomian, dan Kebijakan Publik: Kumpulan Essay, Kajian dan Hasil Penelitian Kuantitatif & Kualitatif*. Deepublish.

Zhang, L., Zhuang, Y., Ding, Y., & Liu, Z. (2023). Infrastructure and poverty reduction: Assessing the dynamic impact of Chinese infrastructure investment in sub-Saharan Africa. *Journal of Asian Economics, 84*(2699), 101573. https://doi.org/10.1016/j.asieco.2022.101573