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The Moderating Role of Zakat on the Nexus between Human Development, Unemployment, and Poverty in Nusa Tenggara Barat Province

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Abstract – Poverty remains a complex phenomenon in developing countries, necessitating comprehensive and measurable alleviation strategies. This study aims to explore the moderating role of zakat in the relationship between human development, unemployment, and poverty at the regional level, specifically in West Nusa Tenggara (NTB) Province. Despite its significant potential in tourism and agriculture, NTB continues to face poverty rates above the national average. Adopting a quantitative approach, this research analyzes panel data from 10 districts/cities in NTB Province over the 2019–2024 period, resulting in 60 observations. The analysis employs the Random Effect Model and Moderated Regression Analysis (MRA) to test the interaction strength between variables. The results indicate that the Human Development Index (HDI) has a significant negative effect on poverty (β = -2.272986; $p < 0.05$), confirming that enhancing human capital quality directly reduces poverty levels. Conversely, unemployment shows a positive but statistically insignificant effect on poverty in the region. A key finding of this study is that zakat significantly moderates the relationship between HDI and poverty, although the interaction direction suggests a weakening effect (β = 0.089666; $p < 0.05$). Furthermore, zakat is found not to moderate the link between unemployment and poverty. Overall, poverty reduction in NTB is primarily driven by improvements in quality of life, while the effectiveness of zakat needs to be optimized by shifting its management from consumptive programs toward more productive and sustainable economic empowerment initiatives.

Abstrak *– Kemiskinan merupakan fenomena kompleks di negara berkembang yang memerlukan strategi pengentasan yang komprehensif dan terukur. Penelitian ini bertujuan untuk mengeksplorasi peran zakat sebagai variabel moderasi dalam hubungan antara pembangunan manusia, pengangguran, dan tingkat kemiskinan di tingkat regional, khususnya di Provinsi Nusa Tenggara Barat (NTB). Meskipun NTB memiliki potensi besar di sektor pariwisata dan pertanian, provinsi ini masih menghadapi tantangan angka kemiskinan yang berada di atas rata-rata nasional. Menggunakan pendekatan kuantitatif, penelitian ini menganalisis data panel dari 10 kabupaten/kota di Provinsi NTB selama periode 2019–2024, menghasilkan total 60 observasi. Metode analisis yang digunakan meliputi Random Effect Model dan Moderated Regression Analysis (MRA) untuk menguji kekuatan interaksi antar variabel. Hasil penelitian menunjukkan bahwa Indeks Pembangunan Manusia (IPM) memiliki pengaruh negatif dan signifikan terhadap kemiskinan (β = -2,272986; $p < 0,05$), yang menegaskan bahwa peningkatan kualitas modal manusia secara langsung menurunkan tingkat kemiskinan. Sebaliknya, pengangguran menunjukkan pengaruh positif namun tidak signifikan secara statistik terhadap kemiskinan di wilayah tersebut. Temuan penting dalam studi ini adalah zakat terbukti secara signifikan memoderasi hubungan antara IPM dan kemiskinan, meskipun arah interaksinya menunjukkan pelemahan pengaruh (β = 0,089666; $p < 0,05$). Namun, zakat ditemukan tidak memoderasi hubungan antara pengangguran dan kemiskinan. Secara keseluruhan, pengurangan kemiskinan di NTB didorong oleh peningkatan kualitas hidup, sementara efektivitas zakat perlu dioptimalkan melalui pergeseran manajemen dari program konsumtif menuju program pemberdayaan ekonomi yang lebih produktif dan berkelanjutan.*

Kata Kunci: *Indeks Pembangunan Manusia; Pengangguran; Kemiskinan; dan Zakat*

INTRODUCTION

Poverty constitutes a significant economic challenge in developing countries such as Indonesia. Poverty is a complex phenomenon encompassing insufficient income, a deficiency of skills, limited assets, inadequate social networks, restricted financial resources, low access to information, and insufficient public services. Todaro & Smith (2014) characterize poverty as a condition when individuals or households cannot adequately fulfill and access essential needs, including clothing, food, shelter, healthcare, and education. Addressing poverty is a multifaceted and arduous challenge, whereas effective health care necessitate thorough planning and collaboration. This implementation of poverty allevation polices must be evident in all governmental decisions and executed through sustainable collaborations between the government and the community (Sukirno in Astriana, 2025)

West Nusa Tenggara (NTB) exhibits relatively elevated poverty rates in contrast to other Indonesian provinces. This occurs despite NTB's significant potential in tourism, agriculture, and fisheries. Moreover, geographical conditions, restricted access to healthcare and educational resources, and insufficient employment prospects are elements that intensify poverty. Moreover, reliance on the traditional agricultural sector, susceptible to climate change, presents significant challenges, particularly in rural regions (Kamil *et al*., 2025). The Central Statistics Agency (BPS) indicates that NTB was placed 8th among 10 provinces with the greatest poverty rates in 2023, but subsequently ascended to 12th place in 2024, thereby exiting the top 10. The poverty rate in NTB was 12.91%, surpassing the national average of 9.36% (BPS, 2024). This indicates the necessity for more effective and targeted poverty alleviation strategies.

Table 1. Poverty Rate in NTB Province 2019-2024

YEAR	2019	2020	2021	2022	2023	2024
TK (%)	14.65	13.97	14.14	13.68	13.85	12.91

Source: BPS NTB, 2025

According to Table 1, the poverty rate in NTB Province decreased from 14.65% in 2019 to 13.97% in 2020. In 2021, it increased to 14.14%, thereafter declining to 13.68% in 2022. In 2023, there was a marginal increase to 13.85%, followed by a decrease to 12.91% in 2024 (BPS NTB, 2025). The changes were mostly driven by the COVID-19 pandemic, which disrupted economic activity, elevated unemployment, and diminished individuals' incomes (Abistha et al., 2024). Consequently, there was a transient rise in poverty rates in 2021 and 2023, despite an overall drop in poverty trends in NTB from 2019 to 2024.

The Human Development Index (HDI) is a crucial metric for assessing the efficacy of development and the quality of life in a region. The Human Development Index (HDI) encompasses three fundamental dimensions of human development: health (life expectancy), education (literacy rate and average duration of schooling), and standard of living (real per capita spending) (Koja *et al*., 2024). The quality of human resources is assessed by the Human Development Index, commonly referred to as the Quality of Life Index. Individuals with a low Human Development Index will exhibit diminished productivity in the workplace. Budhijana (2019) asserts that a decrease in production adversely affects income and exacerbates poverty rates.

Table 2. Percentage of HDI in NTB Province 2019-2024

YEAR	2019	2020	2021	2022	2023	2024
IPM(%)	68.14	68.25	68.65	69.46	72.37	73.10

Source: BPS NTB (2025)

Based on Table 2, the HDI value of NTB has increased every year from 68.14% in 2019 to 73.10% in 2024 (BPS NTB, 2024). This shows an improvement in the community's standard of living. However, this achievement is still below the national HDI average of 75.02%, making HDI improvement an important factor in reducing poverty in NTB. In theory, poverty and HDI have a negative association, meaning that the higher the HDI of a region, the lower its poverty rate (Saragih *et al*., 2022).

Unemployment is among the important elements that affect poverty levels, besides HDI. As stated by Mankiw (2012), unemployment describes the rate at which the labor market can absorb labor. If unemployment is high, the purchasing power of individuals decreases, and the likelihood of poverty rises. Conversely, full employment can boost people's income and reduce poverty rates (Agustina *et al*., 2019). In this study, the indicator used is the open unemployment rate (OUR), which describes the proportion of the working-age population classified as unemployed.

Table 3. Percentage of TPT in NTB Province 2019-2024

YEAR	2019	2020	2021	2022	2023	2024
TPT(%)	3.28	4.22	3.01	2.89	2.80	2.73

Source: BPS NTB, 2025

Based on Table 3 from the NTB Central Statistics Agency, over the previous five years, West Nusa Tenggara Province's Open Unemployment Rate (TPT) has decreased from 3.28% in 2019 to 2.73% in 2024. In 2020, the OUR experienced a moderate increase to 4.22% due to the impact of the COVID-19 pandemic. The OUR in urban areas was recorded at 2.91%, while in rural areas it was 2.53% (BPS NTB, 2024). However, this decline in unemployment has not been substantially offset by a significant reduction in poverty across all districts and cities in West Nusa Tenggara.

In this study, zakat is not treated simply as an additional variable but is theoretically positioned as a fiscal redistributive instrument grounded in Islamic economic principles (Nurfida et al., 2024). In conventional economics, poverty reduction is generally explained through human capital theory, where improvements in education, health, and living standards, as reflected in the Human Development Index (HDI), can increase productivity and income (Todaro & Smith, 2015; UNDP, 2024). However, this mechanism does not always guarantee equitable access to resources, especially for vulnerable groups.

From an Islamic perspective, zakat has significant social and economic value because it reduces inequality and poverty by allocating funds to eligible recipients (Laelani & Nurhadi, 2025). Zakat complements conventional economic mechanisms by channeling resources directly to those entitled to receive the benefits, thereby reducing inequality and increasing their economic participation. In this context, zakat is expected to contribute to human development outcomes by strengthening disadvantaged groups' ability to benefit from improvements in the HDI.

Furthermore, zakat can address labor-market bottlenecks. Although this figure reflects limited labour absorption, zakat especially in productive forms can provide capital support and economic empowerment, enabling individuals to generate income independently outside the formal sector (Fatimah et al., 2025). Therefore, zakat is theoretically suitable as a moderating variable because it can strengthen or increase the influence of the Human Development Index (HDI) and poverty on poverty, depending on the effectiveness of its distribution and management.

Research that simultaneously examines the influence of HDI and unemployment on poverty, with zakat as a moderating variable, is still limited, particularly in the NTB regional context. Previous literature tends to be descriptive and rarely emphasizes the theoretical mechanisms by which zakat can moderate the relationship between HDI, unemployment, and poverty. Based on this gap, this study aims to analyse the influence of HDI and unemployment on poverty in NTB and explore the moderating role of zakat in strengthening or weakening this relationship.

LITERATURE REVIEW

Ragnar Nurkse first presented the concept of the poverty cycle in his 1953 article, "Problems of Capital Formation in Underdeveloped Countries." Ragnar elucidated that the cycle of poverty is defined by various linked and mutually reinforcing causes, which perpetuate a nation's status of chronic poverty and pose significant barriers to attaining higher developmental levels (Nurkse dalam Astriana, 2025).

Diverse factors contribute to poverty from a fiscal perspective. From a micro perspective, poverty arises from differences in resource ownership, resulting in unequal income distribution. Impoverished societies typically possess constrained and inferior resources. Secondly, discrepancies in the quality of human resources further intensify poverty, resulting in diminished output. Subpar human resource quality may result from heredity, insufficient education, discrimination, or unfavorable circumstances. Third, gaps in capital access intensify poverty due to differences in the ability to secure funding. The notion of the vicious cycle of poverty is fundamentally attributable to these three elements (Rachmawati, 2020).

Poverty denotes the state of persons or entities unable to adequately fulfill their fundamental requirements, encompassing clothes, shelter, sustenance, healthcare, and education. According to Todaro & Smith (2014), assert that poverty is multidimensional, involving not just insufficient income but also restricted access to healthcare, education, capital, work, and involvement in development. This methodology emphasizes the significance of examining persons' capabilities and accessibility in the evaluation of poverty, rather than depending exclusively on income.

The Human Development Index (HDI), according to UNDP (2024), functions as a measure of overall human welfare or quality of life, encompassing the variables of income, living conditions, education, and health. The Human Development Index (HDI) is a comparative measure encompassing life expectancy, education, literacy, and living standards. The HDI delineates a community's access to developmental outcomes, encompassing health, education, income, and other pertinent elements (Efendi *et al*., 2024).

The influence of the Human Development Index (HDI) on a community's quality of life is also

evaluated. A diminished Human Development Index (HDI) is typically associated with reduced labor productivity and economic policies impacting income, potentially leading to heightened poverty due to inadequate earnings (Nasution *et al*., 2024)

According to Sukirno (2016), in (Putri & Hutabarat, 2022), unemployment defines an individual of productive working age who is actively pursuing employment with a specific remuneration level but has not yet attained the desired position. The proportion of the labor force that is unemployed and actively seeking employment is termed the open unemployment rate (TPT). TPT serves as a metric to assess the number of unfilled job vacancies within a specific region's labor market.

Unemployment is typically characterized as a condition when individuals classed as members of the labor force lack employment yet are prepared to work and actively pursue job opportunities. In a nation, the unemployment rate is typically quantified as the percentage of individuals not engaged in employment relative to the total labor force (Dinata *et al*., 2020). Elevated unemployment can engender a cycle of poverty, wherein individuals or families suffer a reduction in income owing to job loss and restricted access to essential resources, including health and educational facilities. This state confines individuals to poverty that is challenging to escape without external aid or policies that promote economic development and ensure sufficient employment possibilities. Consequently, diminishing the open unemployment rate is essential for alleviating poverty, as gainful employment and consistent income serve as foundations for enhancing quality of life and lowering poverty levels (Suharti & Monika, 2024).

According to Law No. 23 of 2011, designates zakat as a religious instrument intended to enhance community welfare and justice. For zakat to yield maximum advantages, it must be administered by a structured entity in compliance with Islamic law (UU RI, 2011). The theory of zakat emphasizes the importance of effective and efficient management and distribution of zakat. In the modern era, many countries with Muslim majorities have established official zakat management institutions tasked with collecting, managing, and distributing zakat in an orderly manner. This approach emphasizes the need for transparency and accountability, so that zakat funds are truly received by those who are entitled to them and used for their intended purposes. With good governance, zakat not only plays a role in reducing poverty but can also increase the economic independence of its recipients (Nurhakim & Budimansyah, 2024).

Zakat is categorized into two primary categories in practice: consumptive and productive zakat. Consumptive zakat is provided as direct aid, including essential goods. Concurrently, productive zakat is allocated as business financing, skills training, or production equipment to empower mustahik, enabling them to establish self-sustaining enterprises. The productive zakat strategy is gaining prominence due to its potential for long-term enhancement of income and economic autonomy for receivers (Pitriani *et al*., 2025).

The Relationship Between HDI and Poverty

According to Schultz (1962), people are a type of capital that can boost income and productivity by investing in training, health, and education. The Human Development Index (HDI) gauges the caliber of human resources in a given area. Regions with high HDI generally show better community income levels and lower poverty rates. Conversely, when the HDI is low, poverty rates tend to be higher. Therefore, poverty may decline if the HDI rises and an increase in the HDI has the potential to reduce poverty (Saerendra *et al*., 2025).

Previous studies (Arianto & Cahyono, 2025) consistenly find that poverty levels in Indonesia were found to be significantly impacted negatively by the HDI variable. This means that a decrease in poverty levels is directly influenced by an increase in people's living standards, including education and health standards.

H1: Poverty is negatively and significantly influenced by the human development index.

The Relationship Between TPT and Poverty

According to Keynesian theory, production levels and employment are determined by aggregate demand. If aggregate demand is low, production declines, unemployment rises, and household income falls. This

situation ultimately increases poverty. In other words, unemployment plays a role as one of the causes of increasing poverty (Ismail, 2016).

Previous studies (Adam et al., 2022) consistently find that unemployment has a substantial and favourable impact on poverty. This implies that poverty in the North-North Region will rise in tandem with an increase in the open jobless rate.

H2: Poverty is positively and significantly influenced by unemployment.

The Relationship Between Zakat as a Moderating Variable of Human Development Index (HDI) on Poverty

In Islam, zakat is a redistribution instrument that aims to improve the welfare of mustahiq (those entitled to receive zakat) and reduce economic inequality. Zakat not only functions as consumptive assistance but can also be applied to economic empowerment through training or business funding (Karuni, 2020). In this study, Zakat acts as a moderating variable, which influences the direction and strength of the HDI's effect on poverty. With effective zakat distribution, the HDI's effect in reducing poverty becomes stronger, while less than optimal zakat distribution can weaken this effect.

Previous research conducted by Amran *et al.* (2024) entitled "The Influence of the Human Development Index and Unemployment on Poverty: Zakat as Moderation" found that zakat can strengthen the influence of the HDI in reducing poverty in DKI Jakarta.

H3: The influence of the HDI on poverty can be moderated by zakat.

The Relationship Between Zakat as a Moderating Variable of TPT and Poverty

According to economic empowerment theory, access to capital, training, and economic resources can increase an individual's ability to be financially stable (Alsop *et al*., 2006). Productive management of zakat funds through business capital, training, or economic empowerment can provide opportunities for mustahis to earn additional income even in conditions of high unemployment (Karuni, 2020).

Zakat funds can be used to help unemployed individuals or families through direct assistance, such as cash or basic necessities, or through productive programs, such as skills training, vocational education, or providing capital for small businesses. These interventions enable Zakat recipients to increase their income and economic independence, thereby mitigating the negative impact of poverty (Nasution et al., 2024). Therefore, theoretically, zakat can act as a moderating variable in the relationship between the poverty rate (TPT) and poverty.

Previous research conducted by Astriana (2025) entitled "The effect of gross regional domestic product, regional minimum wage, and unemployment on poverty with zakat as a moderating variable in Central Java in 2018-2023" discovered that zakat can attenuate the association between unemployment and poverty. This means that zakat plays a role in mitigating the negative impact of unemployment on increasing poverty.

H4: The effect of TPT on poverty can be moderated by *zakat.*

METHOD

This research used a quantitative approach with secondary data from BPS Indonesia, BPS NTB, and Baznas. Panel data, which combines cross-sectional and time series data covering ten districts/cities in NTB Province between 2019 and 2024, was used. The percentage of the impoverished population in a region over a given time period is used to measure the poverty variable in this study. The Human Development Index (HDI) variable is calculated based on percentages and reflects the level of human achievement in a region, addressing issues related to health, education, and reasonable living standards. Meanwhile, unemployment is measured as the percentage of the open unemployment rate (TPT). The zakat variable is measured based on the actual distribution of zakat per capita in each region over a certain period. To ensure scale comparability with other variables and to avoid potential estimation bias, the zakat variable is transformed to its natural logarithm (Ln). This transformation also allows the regression coefficients to be interpreted as elasticities.

This study employs a panel data regression model to examine the impact of TPT and HDI on poverty. Additionally, Moderated Regression Analytic (MRA) is employed as a data analytic method to ascertain the degree to which zakat mitigates the impact of HDI and unemployment on poverty.

The model equation for panel data regression analysis before interaction is as follows:

$$Y = \alpha + \beta_1 \mathrm{HDI}(\mathrm{X}_1) + \beta_2 \mathrm{TPT}(\mathrm{X}_2) + \beta_3 Z\mathrm{akat}(\mathrm{Z}) + \varepsilon_i$$

Hypothesis testing using Moderated Regression Analysis after interaction using the analysis equation that follows:

$$Y = \alpha + \beta_1 \text{HDI}(X_1) + \beta_2 \text{TPT}(X_2) + \beta_3 Zakat + \beta_4 (\text{HDI} * ZKT) + \beta_5 (\text{TPT} * ZKT) + \varepsilon_i$$

Where :

Y	= Poverty
α	= Constant
β	= Regression Coefficient
X1	= HDI
X2	= TPT
Z	= Zakat
HDI*ZKT	= Interaction between HDI and Zakat
TPT*ZKT	= Interaction between TPT and Zakat
ei	= Error

Descriptive Statistical Analysis

The conditions of study data, such as data distribution and patterns, are described using descriptive statistics. This information is presented through mean, median, maximum, minimum, standard deviation, skewness, and kurtosis values. Poverty is the dependent variable in this study, whereas unemployment and the human development index (HDI) are the independent factors. Zakat serves as a moderating variable. The descriptive analysis's findings are as follows:

Table 4. Descriptive analysis

	Poverty	HDI	TPT	Zakat
Mean	13.94550	70.83350	3.469167	22.13733
Median	13.47000	69.87000	3.070000	22.38000
Maximum	29.03000	81.64000	13.90000	23.44000
Minimum	8.000000	64.42000	0.380000	18.81000
Std. Dev.	4.788282	4.475754	1.847894	1.121746
Skewness	1.615032	0.737646	3.110835	-1.421113
Kurtosis	5.605574	2.589406	18.12812	4.631483
Jarque-Bera	43.05583	5.862684	668.9231	26.84997
Probability	0.000000	0.053325	0.000000	0.000001
Sum	836.7300	4250.010	208.1500	1.328240
Sum Sq. Dev.	1352.731	1181.910	201.4681	7.424057
Observations	60	60	60	60

Source: processed, 2025

Table 4 reveals that 60 samples, spanning the years 2019 to 2024, were taken from every district and city in NTB Province. The poverty variable (Y) has a mean of 13.94550, a maximum of 29.03000, a minimum of 8.000000, and a standard deviation of 4.788282, according to the descriptive statistics.

The descriptive statistics results for the HDI variable (X_1) show a mean of 70.83350, a maximum of 8.164.000, a minimum of 64.42000, and a standard deviation of 4.475754. Meanwhile, the descriptive statistics results for the independent variable TPT (X_2) show a mean of 3.469167, a maximum of 13.90000, a minimum of 0.380000, and a standard deviation of 1.847894. Finally, the descriptive statistics for the Zakat (Z) variable show a mean value of 22.13733, a maximum of 23.44000, a minimum of 18.81000, and a standard deviation of 1.121746.

Selection of Panel Data Regression Models

This work uses three testing stages, the Chow test, the Hausman test, and the Lagrange Multiplier test, to identify the optimal model selection for evaluating panel data regression. Once the first estimation results from each panel data model are obtained, these three tests are carried out. The following are the steps involved in testing:

Chow Test

Conducting a Chow test is the first step in choosing the best panel data model. The optimal model between the Common Effect Model (CEM) and the Fixed Effect Model (FEM) for this investigation is chosen using this test. The following table displays the Chow test results:

Table 5. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	186.186568	9.47	0.0000
Cross-section Chi-square	216089303	9	0.0000

Source: processed, 2025

The most suitable model for estimating panel data is FEM rather than CEM, according to the Chow test findings based on Table 5, which indicate that the Prob Cross-section F value is < 0.05. In order to decide which model is better for panel data regression analysis the fixed effect model (FEM) or the random effect model (REM), a Hausman test must be conducted.

Hausman Test

In order to choose between the fixed effect model (FEM) and the random effect model (REM) for panel data regression, the Hausman test was performed. The following table displays the regression findings from the Hausman test:

Table 6. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	6.866394	3	0.0763

Source: processed, 2025

The model chosen to estimate panel data is REM rather than FEM. According to Table 6, the Hausman test has a Prob Chi-Square value > 0.05. According to the results of the Chow and Hausman test, this suggests that the REM model is the most appropriate. The LM (Lagrange Multiplier) test is carried out once REM is determined to be the optimal model.

Lagrange Multiplier Test

A model selection test called the Lagrange Multiplier is used to determine which of the Random Effect Model (REM) and the Common Effect Model (CEM) is best for panel data estimation.

Table 7. Lagrange Multiplier Test

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	104.6074	1.123545	105.7309
	(0.0000)	(0.2892)	(0.0000)
Honda	10.22777	-1.059974	6.482613
	(0.0000)	(0.8554)	(0.0000)
King-Wu	10.22777	-1.059974	5.262394
	(0.0000)	(0.8554)	(0.0000)
Standardized Honda	12.11444	-0.809272	4.796355
	(0.0000)	(0.7908)	(0.0000)
Standardized King-Wu	12.11444	-0.809272	3.425305
	(0.0000)	(0.7908)	(0.0003)
Gourieroux, et al.	--	--	104.6074
			(0.0000)

Source: processed, 2025

According to Table 7 above, the random effect model (REM) outperforms the common effect model (CEM) with a Breusch-Pagan value of 0.000 < 0.05. The random effect model is therefore the most

appropriate and optimal for panel data estimation in this study, according to the findings of the three testing phases that were conducted.

Classical Asumption Test

The best estimation outcome from the three testing stages, the Chow, Hausman, and LM tests, is the random effect model. Compared to the fixed effect and common effect models, the random effect model employs a different approach. Ordinary Least Squares (OLS) is used in FEM and CEM, whereas Generalized Least Squares (GLS) is utilized in the random effect model.

According to (Gujarati & Porter, 2009), GLS does not require classical assumption testing because this method meets the Best Linear Unbiased Estimator (BLUE) requirement, making it more efficient than OLS. Thus, this study did not conduct checks for assumptions like autocorrelation, heteroscedasticity, and normality.

Panel Data Regression Analysis

The results of panel data regression estimation using the chosen model, the Random Effect Model (REM), are shown in the following:

Table 8. Panel Data Regression Analysis Results Before Interaction

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.08614	4.088483	8.581701	0.0000
HDI	-0.233297	0.042930	-5.434359	0.0000
TPT	-0.059273	0.057094	-1.038160	0.3037
Zakat	-0.199201	0.113872	-1.749348	0.0857

Source: processed, 2025

This is one way to formulate the regression equation, based on Table 8 above:

$$Y = 35.08614 - 0.233297\text{HDI}X_1 - 0.059273\text{TPT}X_2 - 0.001992\text{Zakat}Z + \varepsilon$$

Moderated Regression Analysis-(MRA)

A moderating variable is a variable that plays a role in strengthening or weakening the connection between the independent and dependent variables. The examination of the MRA regression findings using the chosen model, the random effect model (REM), is as follows:

Table 9. MRA Regression Analysis Results for Panel Data After Interaction

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	165.0387	53.56375	3.081165	0.0032
HDI	-2.107535	0.760506	-2.771226	0.0076
TPT	0.212696	0.744830	0.285563	0.7763
Zakat	-5.893.696	2.404.596	-2.451013	0.0175
HDI*ZKT	0.082417	0.034089	2.417733	0.0190
TPT*ZKT	-0.017856	0.038293	-0.466304	0.6429
	Effects Specification			
			S.D.	Rho
Cross-section random			2.143408	0.9354
Idiosyncratic random			0.563440	0.0646
	Weighted Statistics			
Root MSE	0.635134	R-squared		0.409357
Mean dependent var	1.488039	Adjusted R-squared		0.354668
S.D. dependent var	0.833398	S.E. of regression		0.669490
Sum squared resid	24.20370	F-statistic		7.485150
Durbin-Watson stat	1.214070	Prob(F-statistic)		0.000021
	Unweighted Statistics			
R-squared	0.380077	Mean dependent var		13.94550
Sum squared resid	838.5889	Durbin-Watson stat		0.035041

Sumber: Prosessed, 2025

The regression model equation determined using Table 9 is as follows:

$$Y = 165.0387 - 2.107535\text{HDI}(X_1) + 0.212696\text{TPT}(X_2) - 5.893696\text{Zakat}(Z) + 0.082417(\text{HDI} * Z\text{KT}) - 0.017856(\text{TPT} * Z\text{KT}) + \varepsilon_i$$

T-test (Partial)

Based on the estimation results obtained from the T-test in Table 8, the following conclusions can be drawn:

First, the independent variable HDI (X_1) obtained a negative coefficient value of -2.107535 with a probability of 0.0076 < 0.05. This indicates that HDI (X_1) has a negative and significant effect on poverty (Y), partially.

Second, the independent variable TPT (X_2) obtained a positive coefficient value of 0.212696 with a probability of 0.7763 > 0.05. This indicates that TPT (X_2) has a negative and insignificant effect on poverty (Y), partially.

Third, the interaction variable between IPM and Zakat (X_1Z) obtained a positive coefficient value of 0.082417 with a probability of 0.0190 < 0.05. This indicates that zakat can moderate the relationship between IPM (X_1) and poverty (Y). However, the positive sign of the interaction term suggests that zakat weakens the negative effect of HDI on poverty. In other words, the poverty-reducing impact of HDI becomes smaller as zakat increases.

Fourth, the interaction variable between TPT and Zakat (X_2Z) obtained a negative coefficient value of -0.017856 with a probability of 0.6429 > 0.05. This indicates that zakat has not been able to moderate the effect of TPT (X_2) on poverty (Y).

F-test (Simultaneous)

Based on Table 9, the calculated F value or F statistic is 7.485150, with a probability level of 0.000021 < 0.05. This finding indicates that all variables estimated in the model simultaneously or concurrently have an effect on poverty.

Coefficient of Determination Test (R^2)

Based on the information in Table 8, the regression results show an adjusted R^2 value of 0.354668, which means that 35.46% of the variance in poverty levels can be explained by all of the factors included in the research. In the meantime, factors not included in the study but outside the model account for 64.54% of the explanation.

DISCUSSION

The Effect of the Human Development Index on Poverty

According to Table 8's regression results, the Human Development Index variable (X_1) had a coefficient value of -2.107535 and a probability value of 0.0076 < 0.05. This suggests that the poverty rate in West Nusa Tenggara Province is negatively impacted by the HDI in a statistically meaningful way. Assuming all other variables stay the same, a 1% increase in the HDI is predicted to lower the poverty rate by 2.107535%. The HDI and poverty have an inverse relationship, as indicated by the negative coefficient, which implies that a rise in the HDI is correlated with a fall in the poverty rate. Thus, hypothesis H1 is supported.

The results of this study are consistent with the human capital hypothesis (Schultz, 1962), which holds that enhancing people's quality of life through education, health, and skill development is an investment that can raise societal welfare and productivity. Therefore, an increase in a region's Human Development Index is correlated with an increase in people's ability to escape poverty. Furthermore, the findings of this study can be observed in the situation in West Nusa Tenggara over the previous six years. Data from the Central Statistics Agency (BPS NTB, 2024) shows that the Human Development Index (HDI) of NTB has increased significantly from 68.14% in 2019 to 73.10% in 2024. This increase coincided with a decline in the poverty rate, which fell from 14.65% to 12.32% over the same period. In 2024, Mataram City had the highest Human Development Index (HDI) among the ten districts, reaching 81.64%, which indicates a decline in poverty rates relative to locations with lower HDI, such as North Lombok District, which recorded 68.64% during the same period. This shows that improvements in living standards, educational achievement, and health services in the NTB community have contributed substantially to the decline in poverty rates, thus reinforcing the findings of regression studies that show a significant negative correlation between HDI and poverty rates in NTB Province.

The findings of this study are consistent with research by (Budhijana, 2019) entitled "Analysis of the Effect of Economic Growth, Human Development Index, and Unemployment on Poverty Rates in Indonesia from 2000 to 2017," which found that the HDI variable had a significant negative impact on the poverty rate variable in Indonesia from 2000 to 2017, with a higher quality HDI capable of reducing poverty rates. Additionally, this study is backed by research carried out by Arianto & Cahyono (2025) entitled "The Effect of Human Development Index and Unemployment on Poverty in Indonesia 2018-2023," which discovered that poverty rates in Indonesia are significantly impacted negatively by the HDI. This implies that lowering poverty rates is closely related to raising community standards of living, health, and education.

The Effect of Open Unemployment (TPT) on Poverty

The open unemployment rate variable (X2) has a coefficient value of 0.212696 and a probability of 0.7763 > 0.05 based on the regression results in Table 8. hese results indicate that the Open Unemployment Rate (TPT) has a positive but statistically insignificant impact on poverty in West Nusa Tenggara Province. Theoretically, poverty would decrease by 0.212696 percent for every 1% increase in TPT; however, this effect is not statistically significant. Since hypothesis H2 contradicts the original hypothesis, it cannot be accepted.

The findings of this study are not in line with economic theory, which states that an increase in unemployment will reduce household income, thereby increasing the risk of poverty, because people do not earn sufficient profits or income. In addition, high unemployment has the potential to trigger social and political unrest, which ultimately has a negative impact on human welfare and long-term economic growth potential (Sukirno dalam Hanifah & Hanifa, 2021). Open unemployment has several categories, such as those who are looking for work, underemployed, choosing a job, preparing for a business, and workers who are already working but have not been hired. Therefore, all types of open unemployment are not included in the poor category, because the majority are involved in the informal sector, where they can still meet their basic needs (Syafrina, 2023)

This finding can be explained by the characteristics of the NTB labor market, which is dominated by the informal sector, particularly in small trade, agriculture, fisheries, and tourism services. Data obtained from (BPS NTB, 2024) shows that 70.51 percent or 2.19 million of NTB's population works in the informal sector, while 29.49 percent or 915,850 people work in the formal sector. This condition illustrates that a portion of the population still earns an income even though they do not work in the formal sector. Therefore, unemployment is not a major factor that significantly affects the poverty rate in NTB and also shows that not all unemployed individuals are classified as poor or have low incomes.

The findings of this study are consistent with research by (Sukron & Yasin, 2021) who found that while unemployment affects poverty levels in Central Java, most households do not face liquidity constraints. As a result, unemployment is not a major factor significantly influencing poverty in Central Java, and not all unemployed individuals are classified as poor or low-income. This suggests that the relationship between unemployment and poverty in East Java is also shaped by workforce structure and job quality. Additionally, research by (Dinata et al., 2020) supports these conclusions, demonstrating that unemployment had an insignificant positive effect on poverty in Riau from 2003 to 2018.

The Effect of the Human Development Index (HDI) on Poverty with Zakat as a Moderator

The coefficient value is 0.082417, with a probability of 0.0190 < 0.05, based on results from a Moderated Regression Analysis (MRA) that includes the interaction term between the Human Development Index (HDI) and zakat as a moderating variable (X_1Z). This indicates that zakat plays a significant moderating role in the relationship between the HDI and poverty. A negative HDI coefficient indicates that higher human development can reduce poverty. However, a positive interaction coefficient indicates that zakat weakens the HDI's effect on poverty reduction. In other words, as zakat increases, the HDI's effectiveness in reducing poverty decreases. Therefore, hypothesis H3 is accepted, as there is a moderating effect, albeit weak.

This finding indicates that the utilisation of zakat has not fully supported the transformation of human development quality into sustainable economic independence. One possible cause is that zakat distribution still tends to be consumptive and short-term-oriented, thereby not optimally promoting productive economic empowerment (Beik & Arsyianti, 2016). This condition can lead to dependence on aid, so that improvements in education, health, and living standards do not fully translate into sustainable income increases (Hafidhuddin, 2002).

Nevertheless, various zakat programs implemented by Baznas NTB, such as assistance for affordable housing, healthcare services through the NTB Sehat program, and business support through the ZKUK program, continue to contribute to improving community welfare. However, the resulting

impacts tend to be short-term. Therefore, for zakat to play a more optimal role in strengthening the influence of human development on poverty reduction, zakat management is needed that focuses more on productive aspects and long-term economic empowerment (Karuni, 2020).

The results of this study align with those of Amran et al. (2024), in a study entitled "The Influence of the Human Development Index and Unemployment on Poverty: Zakat as Moderation", which found that zakat moderates the effect of the Human Development Index on poverty. However, this study provides additional findings that the direction of zakat moderation tends to weaken, which indicates that the effectiveness of zakat is highly dependent on the pattern of its management and utilization. Similar findings are also supported by Fadila et al. (2024), titled "The Influence of Human Development Index and Gross Regional Domestic Product on Poverty in Medan City With Zakat Funds As a Moderation Variable", which emphasizes the importance of optimizing zakat management to contribute more effectively to poverty alleviation. Thus, zakat not only functions as a socio-religious instrument but also as an economic instrument that requires proper management to support sustainable poverty alleviation.

The Effect of Open Unemployment (TPT) on Poverty with Zakat as a Moderator

The coefficient value is-0.017856 with a probability of 0.6429 > 0.05 based on the findings of the MRA analysis using the interaction variables of TPT and zakat (X_2Z). Therefore, it can be concluded that zakat is unable to mitigate the impact of TPT on poverty. Because hypothesis H4 does not align with what was suggested, it is rejected in this investigation.

This condition is influenced by the characteristics of structural unemployment in NTB, mainly due to a lack of skills and low job quality. According to data from BPS NTB (2024), vocational school graduates have the highest TPT at 4.74 percent. This indicates that many graduates do not have the skills required by industry, so they cannot be accepted into the formal sector. They do not automatically become poor because most of the unemployed work in the informal sector. On the contrary, productive zakat programs are still limited and unable to overcome the underlying structural unemployment problem, so zakat focuses more on meeting the basic needs of *mustahik*. As a result, zakat is not strong enough to weaken or strengthen the relationship between TPT and poverty.

The results of this study are consistent with the findings (Nasution *et al*., 2024) in a study entitled "Determinants of Poverty Levels in North Sumatra Province: The Role of Zakat as a Moderating Variable," which found that the strength or weakness of the influence of unemployment rates on poverty levels in North Sumatra Province cannot be moderated by zakat because zakat collection in the region is relatively low and not proportional to the number of poor people, and because there are districts/cities where the majority of the population is non-Muslim, so that zakat cannot be maximized as a moderator. Additionally, this study is supported by the findings (Hermawan & Bahjatulloh, 2022) in a study entitled "The Effect of Regional Gross Domestic Product (RGDP), Education, and Unemployment on Poverty Levels with Zakat as a Moderating Variable in Indonesia from 2016 to 2020," which found that the relationship between the unemployment variable and poverty levels, which is negative and insignificant, cannot be moderated by zakat. In general, zakat received by mustahiq has the ability to increase people's purchasing power through consumption, but this potential has not been optimally utilized. This shows that zakat has not been managed effectively to help recipients become more financially independent. On the contrary, high unemployment rates remain a factor that exacerbates poverty. As a result, zakat has not been effective in reducing the impact of unemployment on poverty.

CONCLUSION

The findings indicate that the Human Development Index (HDI) negatively and significantly affects poverty in West Nusa Tenggara Province during the 2019–2024 period. This suggests that enhancements in education, health, and living standards contribute to poverty reduction. In contrast, the Open Unemployment Rate (TPT) shows a positive, though statistically insignificant, effect on poverty. The moderation analysis reveals that zakat significantly moderates the relationship between HDI and poverty, but in a manner that weakens this association. This finding indicates that current zakat management is suboptimal in facilitating the transformation of human development into economic independence. Additionally, zakat does not moderate the effect of TPT on poverty. These findings underscore the necessity to enhance zakat management to become more productive and empowerment oriented. BAZNAS NTB should improve program coordination with local governments, particularly by integrating zakat initiatives with poverty alleviation policies and by strengthening the education, health, and micro-enterprise sectors in a sustainable manner.

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